

REGIONAL CENTRE
DIARY NO.
23/10/92
LUDHIANA-141006

23/10/92

Med. & Aromat. Plants Abstr. Vol. 14 No. 5 pp. 457-578
October 1992
ISSN : 0250-4367

MEDICINAL & AROMATIC PLANTS ABSTRACTS

REPORTING CURRENT WORLD LITERATURE



PUBLICATIONS & INFORMATION DIRECTORATE, CSIR, NEW DELHI

The Treatise on Indian Medicinal Plants

Editors: Asima Chatterjee and Satyesh Chandra Pakrashi

Pages: 172

Price: Rs. 250/-

Ayurveda, the indigenous system of medicine, advocates the application of various Indian herbs in curing many maladies. Several drugs of plant origin are used in Ayurveda.

The Treatise on Indian Medicinal Plants, Vol. I, the first in a series of six volumes, covers 111 plants. The write-up on each plant includes its vernacular name, occurrence and distribution, botanical description, and therapeutic uses along with important chemical constituents of the plant extract. A distinctive feature of the book is inclusion of authentic Sanskrit *slokas*, both in Devnagri and Roman scripts. The *slokas* explain the therapeutic uses of individual plants. A glossary gives the meanings of Sanskrit/Ayurvedic and medical terms. Also, a list of books referred to has been given for ready reference.

The book is profusely illustrated with both coloured and black and white pictures to enable proper identification of plant species.

The editors of the book are eminent scientists in the field. Professor Chatterjee, a Padma Bhushan and a winner of the S.S. Bhatnagar Award, is a chemist of world repute. She is currently the coordinator of the Centre of Advanced Studies on Natural Products, Department of Pure Chemistry, Calcutta University. Dr Pakrashi, the former Director of Indian Institute of Chemical Biology, Calcutta and a Fellow of the Indian National Science Academy is at present a Distinguished CSIR Fellow.

This volume would prove immensely useful to teachers, researchers and specialists in the field of Ayurveda and medicinal plants.

Insight into Scientific Research in Indian Universities & the Institutes of Technology

Rais Ahmed and Madhulika Rakesh

Pages : v + 155

Price : Rs 140/-

The role of scientific research in industry, trade, defence and in the day-to-day life of an individual cannot be over-emphasized. It, therefore, becomes pertinent to take a holistic view not only of the various parameters of research but also to assess its organizational patterns, and human relations, values and attitudes associated with it, which are the main factors responsible for the germination and growth of research *per se*.

Insight into Scientific Research encompasses an exhaustive yet interesting study of the quality, character and efficiency of scientific research in Indian universities and other research institutions.

Several recommendations ranging from adequate financial support, reform of education leading to research, and utilization of research results would enlighten the reader. The book also throws light on what should be the research policy for Indian universities and research institutions.

One of the authors, Professor Ahmed, a Padma Bhushan is a renowned physicist. At present he is Executive Director of the Tertiary Education Commission in Mauritius. The coauthor Ms. Rakesh is an experienced researcher in the field of investigating conditions, process and value systems of scientific research.

Well illustrated with graphs and tables, which aid the text, the book should be a valuable possession for all involved in the scientific and technological development of the country.

Order for the books should be accompanied by M.O./D.D. made payable to "**Publications & Information Directorate**" and sent to:
Sales and Distribution Officer.
PUBLICATIONS & INFORMATION DIRECTORATE
Dr. K.S. Krishnan Marg,
New Delhi-110012.

RENEWAL NOTICE

Your subscription which expires with the despatch of December 1992 issue of the journal, stands for renewal. We request you to be so good as to return the enclosed order form duly filled, early, so as to ensure continuity in despatch.

Sales & Distribution Officer

Order No.....

DATED :

The Sales & Distribution Officer
Publications & Information Directorate, C.S.I.R.
Dr. K.S. Krishnan Marg, New Delhi-110012 (INDIA)

Dear Sir,

Please renew my subscription/enrol me as a subscriber to :

		Rs	\$	£
1.	Journal of Scientific & Industrial Research (Monthly)	250.00	100.00	80.00
2.	Indian Journal of Chemistry, Section A (Monthly)	400.00	150.00	100.00
3.	Indian Journal of Chemistry, Section B (Monthly)	400.00	150.00	100.00
4.	Indian Journal of Experimental Biology (Monthly)	350.00	150.00	80.00
5.	Indian Journal of Technology (Monthly)	300.00	150.00	80.00
6.	Indian Journal of Pure & Applied Physics (Monthly)	300.00	150.00	80.00
7.	Indian Journal of Biochemistry & Biophysics (Bimonthly)	150.00	75.00	40.00
8.	Indian Journal of Marine Sciences (Quarterly)	160.00	65.00	40.00
9.	Indian Journal of Radio & Space Physics (Bimonthly)	150.00	75.00	40.00
10.	Indian Journal of Fibre & Textile Research (Quarterly)	160.00	65.00	40.00
11.	Research & Industry (Quarterly)	160.00	65.00	40.00
12.	Medicinal & Aromatic Plants Abstracts (Bimonthly)	300.00	125.00	75.00
13.	Current Literature on Science of Science (Monthly)	150.00	90.00	48.00
14.	C.S.I.R. News (Semi-Monthly)	50.00	20.00	12.00

(Please tick the periodicals you would like to subscribe).

for one year from January 1993 for which I am/we are enclosing a cheque/Demand Draft
Nodated for a sum of Rs
£\$ in favour of

PUBLICATIONS & INFORMATION DIRECTORATE, NEW DELHI

COMPLETE MAILING ADDRESS

Name

Address

Country/State

(Signature)

Notes :

- Subscription at annual rates for all the periodicals are enlisted for the full volumes, i.e. for the period from January to December only.
- The Cheque/Demand Draft may please be drawn in favour of "PUBLICATIONS & INFORMATION DIRECTORATE, NEW DELHI". Banking charges shall be borne by the subscriber. For inland/outstation cheques please add Rs.10.00 for Foreign Cheques please add \$ 2.00 or £ 1.00.
- The supply will commence on receipt of subscription in advance.
- Foreign subscription rates are for delivery by surface mail. Air mail rates will be supplied on request.

MEDICINAL & AROMATIC PLANTS ABSTRACTS

Medicinal & Aromatic Plants Abstracts (MAPA), issued bimonthly, reports current world literature on medicinal and aromatic plants. Started in 1979 with a coverage of 272 journals, MAPA now scans some 600 journals published in 22 languages from 55 countries of the world. Each issue of MAPA in addition to carrying about 700 abstracts, includes patents and papers presented at the national and international seminars and symposia in the field. Recently MAPA database has been computerized.

MAPA has made significant progress within thirteen years of its existence and attracted the attention of several international agencies. Bilateral collaboration has been entered into with some

member countries of Association for Science Cooperation in Asia (ASCA) for sending inputs from their respective countries for MAPA.

Collaborating Agencies: The Japanese Information Centre for Science & Technology (JICST), Tokyo. Courtesy: Mr. Takeyoshi Hanada; Thai National Documentation Centre (TNDC), Bangkok. Courtesy: Mrs. Nongphanga Chitrakorn; and Department of Science and Industrial Research (DSIR), Wellington. Courtesy: Dr. Q.W. Ruscoe.

The journal has an International Advisory Committee and an Editorial Committee as under:

INTERNATIONAL ADVISORY COMMITTEE

Prof. Dr K Hüsni Can Baser
Medicinal Plants Research Centre
Anadolu University
Eskisehir
Turkey

Prof. (Dr) J G Bruhn
Swedish Academy of Pharmaceutical Sciences
Stockholm, Sweden

Dr H M Chang
Chinese University of Hong Kong
Hong Kong

Prof. N R Farnsworth
University of Illinois
Chicago, USA

Prof. G M Hocking
Auburn University
Alabama, USA

Prof. S V Kessar
Department of Chemistry
Panjab University
Chandigarh 160 014

Dr B M Lawrence
R.J. Reynolds Tobacco Co.
Winston-Salem, NC, USA

Prof. Xiao Pei-Gen
Institute of Medicinal Plant Development
Beijing, China

Dr J D Phillipson
School of Pharmacy
University of London
London, UK

Prof. (Dr) E Reinhard
Pharmazeutisches Institut der Universität Auf
der Morgenstelle 8
Tübingen, Germany

Prof. A Ruminska
University of Agriculture
Warszawa, Poland

Dr R Verpoorte
Centre for Bio-Pharmaceutical Sciences
University of Leiden
Leiden, The Netherlands

Prof. H Wagner
Institute of Pharmaceutical Biology
University of Munich
Munich, Germany

Dr G P Phondke
Director, PID, Ex-officio

EDITORIAL COMMITTEE

Prof. Ms Sharadini Dahanukar
Seth G.S. Medical College
Bombay 400 012

Dr B N Dhawan
Director
Central Drug Research Institute
Lucknow 226 001

Dr Rajendra Gupta
Project Coordinator
M & A Plants
NBPGR
New Delhi 110 012

Dr R S Kapil
Director
Regional Research Laboratory
Jammu-Tawi 180 001

Dr S C Pakrashi
CSIR Distinguished Fellow
Indian Institute of Chemical Biology
Calcutta 700 032

Dr K M Parikh
Zandu Pharmaceutical Works Ltd
Bombay 400 025

Dr G V Satyavati
Senior Deputy Director General
Indian Council of Medical Research
New Delhi 110 029

Dr R S Thakur
Director
Central Institute of Medicinal and
Aromatic Plants
Lucknow 226 016

Dr G P Phondke
Director, PID, Ex-officio

MEDICINAL & AROMATIC PLANTS INFORMATION SERVICE (MAPIS)

Medicinal and Aromatic Plants Information Service (MAPIS), started in 1976 at PID, offers the following services:

- *Current Awareness Service*—provides information on medicinal and aromatic plants through a bimonthly, *Medicinal & Aromatic Plants Abstracts* (MAPA). For subscription rates see contents page.

- *Selective Dissemination of Information*—will provide, when operational, computerized printout of current titles with abstracts of papers on medicinal and aromatic plants.

- *Technical Enquiry Service*—furnishes information relating to botanical nomenclature, regional names, cultivation methods, chemical constituents, pharmacological properties, uses, etc. Charges per page Rs.10/- for scientists and Rs. 20/- for private entrepreneurs.

- *Bibliography Service*—provides references (retrospective and current) on any aspect of the medicinal and aromatic plants. Charges per page Rs.10/- for scientists and Rs.20/- for private entrepreneurs.

- *Statistical Service*—supplies data regarding production, marketing and trade, import and export of the medicinal and aromatic plants. Charges same as for Technical Enquiry Service.

- *Document Copy Service*—furnishes photocopies of journal articles cited in MAPA @ Re. 1 - per page. Photocopies of the journal articles not available at PID library (as indicated at the end of each abstract) can be obtained by writing to 'Scientist-in-Charge, INSDOC, 14 Satsang Vihar Marg, New Delhi 110067.

All payments should be made in advance by IPO/draft/cheque payable in favour of Publications & Information Directorate (MAPIS).

For details, contact

The Head

Technical Information Services Division

Publications & Information Directorate, CSIR

Dr. K.S. Krishnan Marg, New Delhi 110 012

ACKNOWLEDGEMENTS

The cooperation of the following libraries, located at New Delhi, in allowing the use of their holdings is gratefully acknowledged: National Science Library, National Medical Library, and Libraries of the Indian Agricultural Research Institute, National Physical Laboratory, Delhi University, Indian National Science Academy and World Health Organization (Reg. Office for S.E. Asia).

EDITORIAL STAFF

Editors

H C Jain
S P Mehta (Mrs)
Gian Singh
R Doreswamy
T K Mukherjee

Assistant Editor

Darshan Sharma (Mrs)

Editor-in-Chief

Dr G P Phondke

Annual Subscription

Rs 300.00 \$ 125.00 £ 75.00

Single Copy

Rs 60.00 \$ 25.00 £ 15.00

50% discount admissible to research workers and students and 25% discount to non-research individuals, on annual subscription.

Subscription may be drawn by cheque/bank draft in favour of

Publications & Information Directorate
and sent to:

The Senior Sales & Distribution Officer
Publications & Information Directorate
Dr. K.S. Krishnan Marg
New Delhi 110 012, India

Please add bank charges (Rs 10.00) for outstation cheques in India and for foreign cheques please add \$ 2.00 or £ 1.00

Published by the Publications &
Information Directorate, CSIR,
Dr. K.S. Krishnan Marg, New Delhi 110 012, India

© 1992 The Council of Scientific & Industrial
Research, New Delhi, India

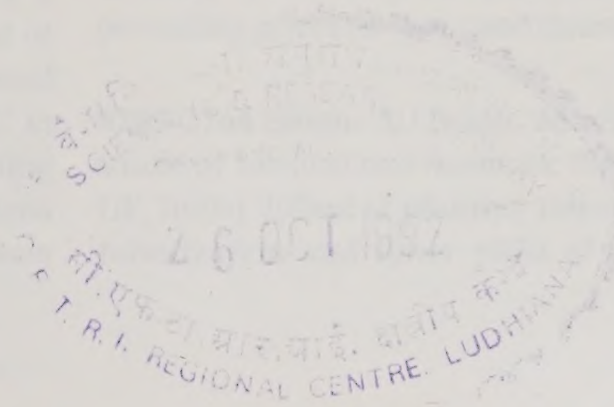
Every effort is made to present the abstracts accurately but MAPA assumes no liability for any errors and omissions.

Medicinal & Aromatic Plants Abstracts

VOLUME 14 NO.5 OCTOBER 1992

Contents

Agronomy	457
Botany (General & Systematic)	458
Breeding & Genetics	459
Diseases & Pests	460
Physiology & Biochemistry	461
Pharmacognosy	474
Clinical Studies	476
Pharmacology & Toxicology	485
Antimicrobial Activity	507
Insecticidal & Piscicidal Activity	512
Phytochemistry	513
Chemotaxonomy	552
Ethnomedicine	554
Analytical & Processing Techniques	555
Miscellaneous	560
New Publications	563
Patents	564
List of Serials Abstracted	567
Botanical Names Index	571



Medicinal & Aromatic Plants Abstracts

Agronomy

9205-2757 Amalraj, V.A., Shankaranarayan, K.A. (Central Arid Zone Research Institute, Jodhpur, Rajasthan, India) **Studies on vegetative propagation of *Balanites roxburghii* PL..** *Indian Forester*, v. 118(4): p. 271-273, 1992 (6 ref, Eng).

Propagation of *B. roxburghii* by stem cuttings and air-layering was tried for two years. Propagation through stem cuttings even with the application of growth hormones viz., IBA, NAA and Seradix B-3 powder failed to root. Rooting was observed by adoption of ringing technique done during monsoon period, with Seradix powder application on the twigs air layered with wet moss.

9205-2758 Dedio, I. (Instytut Roslin i Przetworow Zielarskich, ul. Libelta 27, 61-707 Poznan, Polska) **Hydroponic cultivation of *Aloe arborescens* Mill. Part I. Choice of medium and crop time.** *Herba Polonica*, v. 37(1): p. 21-27, 1991 (8 ref, Eng, Pol).

Application of hydroponic cultivation using the modified Wroclaw method has been described for cultivation of *A. arborescens*. The crop has been obtained in less than 3 years, with better yield. The best sowing time is July.

9205-2759 Gupta, C.R., Singh, P.N., Singh, V.K. (IGKVV, Zonal Agricultural Research Institute, Ambikapur 497 001, MP, India) **Note on response of turmeric (*Curcuma longa* L.) to phosphorus.** *Vegetable Science*, v. 17(2): p. 198-200, 1990 (2 ref, Eng, Hin).

The response of *C. longa* to different levels of phosphorus (P2O5/ ha) was studied. Application of P2O5 @ 75 kg/ha was found optimum, which increased fresh weight of rhizome/hill raw turmeric yield and finally high curing percent. NSL, New Delhi.

9205-2760 Hojden, B., Lamer-Zarawska, F. (Ogrod Roslin Leczniczych, Katedra Biologii i Botaniki AM, ul. Kochanowskiego 12, 51-601 Wroclaw, Polska) **(Studies on cultivation of *Oenothera* species).** *Herba Polonica*, v. 36(4): p. 139-143, 1990 (3 ref, Eng, Pol).

In a three-year studies on several *Oenothera* species (*O. biennis*, *O. paradoxa*, *O. acerviphilla*) *O. biennis* x *O. rubricaulis*, it was found out that the growth period of *O. biennis* was successfully reduced to one year with seed vernalization done at the temperature of 0-2 degree C in 20-25 days. The most positive results (100 percent blooming and full maturity of seeds) was obtained with vernalized seeds of *O. acerviphilla*. The studies showed that optimum

standard for sowing of *O. biennis* was 2,5-3,0 kg of seeds per ha. The seed crop of examined species (average for two-year period) was 119,2-272,0 g/m².

9205-2761 Muni Ram, Subrahmanyam, K., Singh, D.V., Gupta, M.M. (Department of Agronomy and Soil Science, Central Institute of Medical and Aromatic Plants, Lucknow 226 016, UP, India) **Effect of sowing dates and crop geometries on growth and alkaloid yield of Egyptian henbane (*Hyoscyamus muticus* L.).** *International Journal of Tropical Agriculture*, v. 8(4): p. 261-267, 1990 (Recd. 1992, 5 ref, Eng).

In field experiments, *H. muticus* gave maximum crop growth and alkaloid yield when the crop was sown from October 25 to November 25 in the square crop geometry of 30 X 30 cm as compared to the other sowing dates and spacings. However, the alkaloid content of the plants was not influenced by the date of sowing and spacing treatments.

9205-2762 Pank, F. (Central Institute for Special and Ornamental Plants Bernburg, Magdeburger Str. 23a/2002, O-4350 Bernburg, Federal Republic of Germany) **The influence of sprinkler irrigation on the quality of medicinal and aromatic plants.** *Planta Medica*, v. 57(Supplement 2): p. A32-A33, 1991 (2 ref, Eng).

The influence of sprinkler irrigation with different quantities on *Mentha piperita*, *Majorana hortensis* and *Digitalis lanata* was investigated in field experiments on a loess originated chernozem. The application time of the irrigation was controlled by tensiometers. The irrigation influenced the quality of the investigated species.

9205-2763 Rao, V., Reddy, M.S., Gopalakrishna, V., Rao, K.S. (Regional Agricultural Research Station, Andhra Pradesh Agricultural University, Jagtial 505 237, India) **Water-production function and optimal irrigation programme for turmeric (*Curcuma longa*).** *Indian Journal of Agricultural Sciences*, v. 62(6): p. 405-407, 1992 (1 ref, Eng).

Result of experiment conducted to determine water production function for turmeric and its further utilization for economic ramification has been given. Water quantity of 2.0 ha-m was found needed for potential rhizome production and 1,9919 ha-m for maximum net returns under the prevailing prices of water and rhizome yield.

9205-2764 Singh, A., Singh, M., Singh, D.V. (Central Institute of Medical and Aromatic Plants, Lucknow 226 016, UP, India) **Effect of planting time on plant stand, rate of tuberization and tuber yield of medicinal yam (*Dios-***

corea floribunda Mart. & Gal.). *International Journal of Tropical Agriculture*, v. 8(4): p. 289-295, 1990 (Recd. 1992; 10 ref, Eng).

A field experiment was conducted during 1984-86 to study the effect of planting time (planted on the 15th day of each month from January to July) on plant survival, tuber development and tuber yield of a 2-year crop of *D. floribunda* under the sub-tropical climate at Lucknow, India. Yams planted during January, February and March, using tuber dug on the same day, recorded 35-40 percent plant survival at harvest, gave 350-410 mg/plant/day rate of tuberization (dry weight basis) and yielded 60-65 q/ha dry tuber, as against 25 percent plant survival, 365-425 mg/plant/day rate of tuberization and 35-42 q/ha tuber yield, obtained from June and July planting, using pre-sprouted tubers (conventional practice). The May planted crop had the lowest plant survival (8.9 percent) as well as tuber yield (9.3 q/ha), the results are discussed in relation to temperature and humidity effects on sprouting and tuber development.

9205-2765 Singh, K., Chauhan, H.S., Man Singh (Central Institute of Medicinal & Aromatic Plants, Regional Centre Pantnagar, Nangla 263 149, Nainital, UP, India) **Effect of soil moisture regimes, time of interculture and organic mulching on growth and yield of Japanese mint (*Mentha arvensis* L.) and water use efficiency.** *Pafai Journal*, v. 14(1): p. 15-22, 1992 (17 ref, Eng).

Investigations were carried out to find out the most suitable soil moisture regime for scheduling irrigation and to ascertain the appropriate time of application of interculture (weeding and hoeing) and organic mulching and to assess their effect on growth of herb and oil yield of Japanese mint *M. arvensis* and water use efficiency. Results are reported and discussed. NSL, New Delhi.

0100-2766 Singh, S., Singh, M., Siddiqui, M.S., Singh, D.V. (Central Institute of Medicinal & Aromatic Plants, Lucknow 226 016, UP, India) **Comparative performance of vetiver clones.** *Pafai Journal*, v. 14(1): p. 23-26, 1992 (6 ref, Eng).

Studies were conducted to evaluate the yield potential, aroma value, physico-chemical properties of oil of 23 vetiver *Vetiveria zizanioides* clones including improved clones as well as local collection. The results revealed the superiority of clones CIMAP/KS.1 and CIMAP/KS2 over the rest of the clones with respect to yield and quality of oil and are recommended for cultivation. The spectrum of genetic variability of crop improvement is also demonstrated. NSL, New Delhi.

Botany (General & Systematic)

9205-2767 Grayum, M.H. (Missouri Botanical Garden, P O Box 299, St. Louis, Missouri 63166-0299, USA) **Systematic embryology of the Araceae.** *Botanical Review*, v. 57(3): p. 167-203, 1991 (143 ref, Eng).

Embryological data of systematic significance of family Araceae are reviewed and analyzed. Special attention has been given to the determination of character-state polarities i.e. presence of endothelial thickenings; binucleate, starchless pollen; helobial endosperm development; embryogeny and presence of endosperm in ripe seeds. The phylogenetic implications of these conclusions are discussed, and promising avenues for future research have been indicated.

9205-2768 Jordaan, A., Theunissen, J.D. (Department of Plant and Soil Sciences, Potchefstroom University for Christian Higher Education, Potchefstroom 2520, South Africa) **Phenolic deposits and tannins in the leaves of five xerophytic species from Southern Africa.** *Botanical Bulletin Academia Sinica*, v. 33(1): p. 55-61, 1992 (22 ref, Eng).

The histological distribution and structure of phenolic deposits in the leaves of *Diospyros ramulosa*, *Eriocephalus eriocoides*, *Galenia africana*, *Hermannia disermifolia*, *Rhus burchelli* has been reported. The tannin content of leaves was determined and correlated with quantities of phenolic deposits. Results indicate that relatively large amounts of phenolic deposits occur in the leaves of four of the five species. The levels of tannins determined quantitatively suggest that the positively stained cells contain molecules of tanniniferous nature.

9205-2769 Mandal, S., Sengupta, K. (Bidhan Chandra Krishi Vishwavidyalaya, Kalyani 741235, WB, India) **Non-destructive method of leaf-area determination in betelvine (*Piper betle*).** *Indian Journal of Agricultural Sciences*, v. 62(6): p. 412-413, 1992 (5 ref, Eng).

Leaf area of *P. betle* in situ, by developing regression equation was determined. The length (L) of leaves was 10.6 to 21.5 cm and their maximum breadth (B) was 8.9 to 18.2 cm. The actual leaf area, determined by planimeter was 63.7 to 243.1 cm. The regression equation $E = a + bP$ was developed, where E is the expected leaf area and P is the product of L and B. The correlation coefficient between actual leaf area and estimated area was high ($r = 0.977$) and highly significant. The method ensures accurate leaf area determination without plucking or destructing the leaves.

9205-2770 Mansfield, S.G., Briarty, L.G. (Life Sciences Department, University of Nottingham, University Park, Nottingham NG7 2RD, United Kingdom) **Cotyledon cell**

development in *Arabidopsis thaliana* during reserve deposition. *Canadian Journal of Botany*, v. 70(1):p. 151-164, 1992 (75 ref, Eng, Ger).

Cotyledon cell development in *A.thaliana* during reserve deposition has been analyzed qualitatively and quantitatively. Development has been related to the previously defined time scale for *Arabidopsis*, hours after flowering. Between 144 and 216 h after flowering the major cell changes in the cotyledon are an increase in the cell volume, a decrease in the volume fraction of cytoplasm and plastids, and an increase in lipid and vacuole volume fractions. The endoplasmic reticulum and dictyosome volume fractions are high during early reserve formation (144-168 h after flowering) but decrease significantly thereafter. On the basis of this study it is indicated that both the endoplasmic reticulum and dictyosomes are involved in protein synthesis and transport to the vacuole. The accumulation of reserves occurs in a well-defined and relatively short period during late embryogenesis (144-216 h after flowering).

9205-2771 Patel, J.D.(Department of Biosciences, S P University, Vallabh Vidyanagar 388 120, Gujarat, India) **An avowal of structure of crop plants: 6 vegetables and spices.** *Indian Botanical Contactor*, v. 9(2): p.69-115, 1992 (54 ref, Eng).

The review article described the structure and morphogenesis of 6 plant species. Of which 5 were important medicinal species viz.*Capsicum annum*, *Allium sativum*, *Zingiber officinale*, *Curcuma domestica* and *C.annuum*. The origin of extra axillary flowers/inflorescence has been traced. The general organization, plastochronic changes and changes during various growth phases of different plant organs, histogenesis etc are discussed. NSL, New Delhi.

9205-2772 Sastry, T.C.S., Garg, S.(Wealth of India Division, Publications & Information Directorate (CSIR), Dr K S Krishnan Marg, New Delhi 110 012, India) **Correct authority of *Cotula hemispherica* (Asteraceae).** *Journal of Economic and Taxonomic Botany*, v. 15(2): p. 457-458, 1992 (6 ref, Eng).

Correct authority and synonyms of *Cotula hemispherica*, a medicinal herb found widely in North-Eastern states and Upper Gangetic Plains in India have been given.

9205-2773 Subbiah, V.R., Dayanandan, P.(Department of Botany, Madras Christian College, Tambaram, Madras 600 059, TN, India) **Growth Kinetics, vascular differentiation and functions of aerial roots of *Tinospora cordifolia*.** *Journal of Indian Botanical Society*, v. 69(3-4): p. 305-309, 1990 (Recd.1992; 14 ref, Eng).

T.cordifolia produces several metre long unbranched filiform aerial roots which produce laterals only when

damaged or on contact with soil. Maximum elemental rate of elongation occurs 5-10 mm behind the tip and the zone of elongation can be 20 cm long. Colchicine interferes with xylem differentiation. The wall of phloem showed distinct transverse bands of nacreous thickening.

Breeding & Genetics

9205-2774 Hertz, E., Liersch, R. , Scheider, O.(Institut fur Angewandte Genetik, Freie Universitat Berlin, D-1000 Berlin 33, Federal Republic of Germany) **Genetic evidence for the existence of two varieties of *Silybum marianum*.** *Planta Medica*, v. 57(Supplement 2): A30, 1991 (2 ref, Eng).

Crossing experiments between the self-fertile species *S.marianum* and *S.eburneum* were conducted. 20 to 50 single flowers per inflorescence were emasculated before the maturity of the pollen grains and subsequently pollinated two or three times after development of the stigma. In addition, 9 crossing experiments were carried out with 280 single tubiform florets, 5 with *S.marianum* as mother plant and 4 reciprocal crosses as well as 4 unpollinated controls. All F1-plants of two crosses showed the variegated phenotypes only. After selfing of the F1-plants, the F2 generation showed segregation in variegated and green plants in a 3:1 ratio.

9205-2775 Kulkarni, R.N., Ramesh, S.(Central Institute of Medicinal and Aromatic Plants, Regional Centre, Bangalore 560 037, Karnataka, India) **Development of lemongrass clones with high oil content through population improvement.** *Journal of Essential Oil Research*, v. 4(2): p. 181-186 , 1992 (9 ref, Eng).

Fourteen clones with high oil content were developed from cycle-1 (C1) population of a phenotypic recurrent selection program for high oil content in East Indian lemongrass (*Cymbopogon flexuosus*). These clones were evaluated in a one-year trial along with two checks, (i) a local variety, OD 19 and (ii)the best clone from the base population, 52-22. The mean oil contents of these clones ranged from 0.91 to 1.4 percent as against 0.53 of local cultivar, OD 19. The top two clones, R8P6 and R16P3, which were developed from a low citral variant isolated from C1 population, had about 150 and 50 percent higher oil content than OD 19 and 52-22, respectively, their citral contents were significantly lower. However, the citral content of clones PC5 and PC8, was unaffected.

9205-2776 Patel, D.R., Sriram, S., Dalal, K.C.(Medicinal & Aromatic Plants Project, Gujarat Agricultural University, Anand Campus, Anand 388 110, Gujarat, India) **Seed setting in *Isobagul* (*Plantago ovata*, Forsk) as affected by**

length, type, mode and duration of bagging. *Seed Research*, v. 18(2): 101-105, 1990 (2 ref, Eng).

Length of the bag did not affect seed set in *P.ovata*. Open bags gave higher seed set. Lesser the period in bag more was the seed set. Use of 20 cm long tissue paper bag kept closed till milk stage and replaced with polythene bag till harvest to avoid seed shattering is suggested. NSL, New Delhi.

9205-2777 Sareen, S., Koul, A.K. (Department of Biosciences, University of Jammu, Jammu Tawi 180 004, JK, India) **Genetic diversity among Plantagos XXVII. Effect of gamma rays on *Plantago ovata* Forsk.** *Indian Drugs*, v. 29(7): p. 316-317, 1992 (5 ref, Eng).

Seeds of *P.ovata* were exposed to 20-140 KR of gamma rays. L50 of seeds was found to be between 120 and 140 KR dose. Lower doses were stimulatory for plant height, optimum being 40 KR dose. The variance for tiller, spike count and plant height was reduced significantly, while the variance for seed count did not alter. The use of alterations induced in mean and variance of yield related characters in selecting, superior geno-types has been suggested.

9205-2778 Sharma, J.R., Mishra, H.O., Lal, R.K., Shrivastava, R.K. (Central Institute of Medicinal and Aromatic Plants, Lucknow 16, UP, India) **Intraspecific differentiation in Indian opium poppy *Papaver somniferum* L..** *Proceedings of Indian National Science Academy*, v. 58B(2&3): p. 147-152, 1992 (11 ref, Eng).

Genetic differentiation in local landraces of opium poppy (*P.somniferum*) was examined in terms of quantified degree of divergence using multivariate analysis (D2-statistic). The range of D2 values from .83 to 69.43 was indicative of only moderate genetic diversity present in Indian landraces. All the 40 populations examined could be clustered into six group-constellations. Latex yield and capsule number were found to be the common forces of divergence at all the three, inter and intracluster and inter-population levels of differentiation. Diverse agroecological conditions and genetic drift coupled with natural selection are the possible factors responsible for such a diversity in this crop.

9205-2779 Singh, T.P. (Department of Botany, R K College, L N Meithila University, Madhubani 847 211, Bihar, India) **Karyomorphological studies in the populations of *Ocimum kilimandscharicum* Guerke.** *Journal of Indian Botanical Society*, v. 69(3-4): p. 431-434, 1990 (Recd.1992; 7 ref, Eng).

Two populations of *O.kilimandscharicum*, belonging to two different climatic zones, showed the same morphol-

ogy and chromosome number ($2n=76$) but differed in their chromosome size. The species being an aneuploid showed high degrees of meiotic irregularities and multivalent formations. The numbers of nucleoli and nucleolar chromosomes were not found identical in all the nuclei at meiosis.

Diseases & Pests

9205-2780 Chourasia, H.K. (University Department of Botany, Bhagalpur University, Bhagalpur 812 007, Bihar, India) **Aflatoxin contamination in drug yielding plants.** *Journal of Indian Botanical Society*, v. 69(3-4): p. 281-283, 1990 (Recd.1992; 19 ref, Eng).

Of five plant samples used for the preparation of drugs, four were found to be aflatoxin positive. The highest level of contamination was detected in the roots of *Argyrea speciosa* (1.27 microg/g) and the lowest in the rhizome of *Acorus calamus* (0.47 microg/g). *Evolvulus alsinoides* devoid of aflatoxin contaminant.

9205-2781 Kulkarni, S.R., Tipnis, H.P.* (Bombay College of Pharmacy, Kalina, Santacruz(E), Bombay 400 098, Maharashtra, India) **Studies in decontamination of some crude drugs by gamma radiations (Part V) (Vasaka and Ashwagandha).** *Indian Drugs*, v. 29(9): p. 399-403, 1992 (9 ref, Eng).

The powdered drugs (*Adhatoda vasica* and *Withania somnifera*) were irradiated with graded 5, 10, 15, 20 and 25 KGy doses of gamma radiations. The irradiated samples were compared with the controls (unirradiated) with respect to their physico-chemical properties, microbial bioburden and active phytochemical constituents. The investigations revealed that, the irradiation at 10 KGy and 15 KGy dose of gamma radiation could completely decontaminate the samples of both, Vasaka and Ashwagandha, respectively, without altering their physicochemical parameters and active phytochemical constituents.

9205-2782 Naheed Anwar, I. Ahmed, S., Askari, A. (PCSIR Laboratories Complex, Karachi 75280, Pakistan) **Laboratory evaluation of six systemic fungicides for the control of root-rot in *Duboisia leichhardtii* F. Muell.** *Pakistan Journal of Scientific and Industrial Research*, v. 34(10): p. 402-403, 1991 (10 ref, Eng).

D.leichhardtii has prospects of replacing or supplementing *Datura*, *Atropa* and *Hyoscyamus* as source of alkaloids used in pharmacy. *D.leichhardtii* was found infected with the fungus *Fusarium solanii* causing wilting and drooping of the plant. A number of fungicides, viz., Afungan, Benlate, Nimnode, Saprol, Tecto were tried on

laboratory scale. Benlate (20 ppm) was found to be the most effective in controlling the fungus.

9205-2783 Paul, Y.S., Bhardwaj, L.N. (Department of Mycology and Plant Pathology, H P Krishi Viswavidyalaya, Palampur, HP, India) **Phyllosticta leaf spot of *Glycyrrhiza glabra* Linn. a new disease from India.** *Indian Forester*, v. 118(4): p. 301-302, 1992 (5 ref, Eng).

Symptoms of the leaf spot disease of *G. glabra* caused by the fungus *Phyllosticta glycyrrhizae* has been reported for the first time. Pin head size spots of dark brown colour starting first from older leaves, later developed into circular to irregular spots on both the surfaces of the leaves. The lesions were dark brown in the centre and surrounded by light brown margin resulting in zonate appearance. Later, a large number of pycnidia developed on both sides of the spots.

9205-2784 Vanhala, L., Hiltunen, R., Oksman-Caldentey, K.M. (Pharmacognosy Division, Department of Pharmacy, University of Helsinki, SF 00170 Helsinki, Finland) **Virulence of different *Agrobacterium* strains on *Hyoscyamus muticus*.** *Planta Medica*, v. 57(Supplement 2): p. A109-A110, 1991 (4 ref, Eng).

In this investigation the virulence of four different *Agrobacterium* strains on transformation of *H. muticus* are compared. The growth rate and alkaloid production of the hairy root cultures were also studied.

Physiology & Biochemistry

9205-2785 Bachmann, P., Robins, R., Yamada, Y. (Laboratory of Molecular and Cellular Biology, Department of Agricultural Chemistry, Faculty of Agriculture, Kyoto University, Kyoto 606, Japan) **Biosynthesis of the acid moieties of the tropane alkaloids hyoscyamine and littorine.** *Planta Medica*, v. 57(Supplement 2): p. A9-A10, 1991 (4 ref, Eng).

To investigate the sequence of steps of the biosynthetic pathways leading from phenylalanine to the acidic moieties of both alkaloids, in particular to determine at which stage the rearrangement process to tropic acid occurs, specifically {2H}-labelled phenylpyruvic acid and phenyl-lactic acids were synthesised. These were fed to various root cultures, including *Hyoscyamus albus*, *Datura stramonium* and *Anthocercis littorea* which synthesise hyoscyamine and littorine to varying extents as a result of the feeding experiments the pathway leading from phenylalanine to hyoscyamine and littorine has been proposed. An analytical GLC-MS system was developed to allow the independent quantitation of hyoscyamine and littorine.

9205-2786 Barros, A.M.D., Cosson, L., Foulquier, M., Labidalle, S.*, Osuku-Opio, J., Galons, H.*, Miocque, M., Jacquin-Dubreuil, A. (Laboratoire de Botanique et Phytochimie, Laboratoire de Chimie Organique, Université de Paris-Sud, Faculté de Pharmacie, 5 Rue JB Clement, 92296 Chatenay Malabry Cedex, France) **Biotransformation of ethyl 2-acetylamino-2-carbethoxy-4-(phenylsulphinyl)-butanoate by cell suspensions of *Catharanthus roseus* and *Thevetia neriifolia*.** *Phytochemistry*, v. 31(6). p. 2019-2020, 1992 (6 ref, Eng).

Biotransformation of the synthetic substrate, ethyl 2-acetylamino-2-carbethoxy-4-(phenylsulphinyl)-butanoate, by cell suspension cultures of *C. roseus* and *T. neriifolia* was investigated. It was found that only three of six cell lines of *T. neriifolia* tested biotransformed the test substrate into a new product, ethyl 2-acetylamino-2-carbethoxy-4-(phenylsulphonyl)-butanoate, through a selective oxidizing process not previously described. Such a biotechnological process could be of great interest for the production of new chemical compounds.

9205-2787 Baumel, P., Lurz-Gresser, G., Veen, G., Witte, L., Proksch, P., Czygan, F.C. (Institut für Botanik und Pharmazeutische Biologie, Universität Würzburg, Mittlerer Dallenbergweg 64, D-8700 Würzburg, Federal Republic of Germany) **Uptake of host-plant alkaloids by parasitic *Cuscuta* species.** *Planta Medica*, v. 57(Supplement 2): p. A95-A96, 1991 (4 ref, Eng).

Comparative GC as well as GC-MS analysis of the host species viz., *Lupinus*, *Nicotiana*, *Spartium* and *Cytisus*, and the *Cuscuta* species *C. reflexa* and *C. platyloba* revealed an uptake of the host plant alkaloids during parasitism. The total alkaloid concentration (in mg/g dry weight) in both *Cuscuta* species sometimes resembled or even surpassed those of the host plants. The alkaloid patterns obtained from host and parasite differed with regard to their quantitative composition.

9205-2788 Beerhues, L., Karwatzki, B., Rommeswinkel, M., Wiermann, R. (Institut für Pharmazeutische Biologie, Universität Bonn, D-5300 Bonn, Federal Republic of Germany) **In situ localization of chalcone synthase in different plant organs.** *Planta Medica*, v. 57(Supplement 2): p. A11, 1991 (4 ref, Eng).

Using the indirect immunofluorescence technique, chalcone synthase in different plant organs has been localized. A tissue or cell-type specific expression of chalcone synthase was observed. In leaves of various dicotyledonous plants (*Spinacia oleracea*, *Vicia faba*, *Pisum sativum*, *Cicer arietinum*, *Petroselinum crispum*) chalcone synthase is predominantly present in the epidermal and to a lower extent in the subepidermal tissue. Leaves of *Kalanchoe*

daigremontiana and phyllodes of *K.tubiflora* contain idioblasts in the second subepidermal layer. These cells accumulate condensed tannins. In roots of various leguminous plants (*Pisum sativum*, *Phaseolus vulgaris*, *Cicer arietinum*) a strong expression of chalcone synthase is observed in the tip.

9205-2789 Bhavsar, G.C., Upadhyay, U.M.(B V Patel Pharmaceutical Educational Research Development Centre, Ahmedabad, Gujarat, India) **Growth and diosgenin production in the callus culture of *Balanites aegyptiaca*.** *Indian Drugs*, v. 29(8): p. 334-337, 1992 (19 ref, Eng).

Diosgenin content of callus tissue derived from pericarp of *B.aegyptiaca* grown on Revised Murashige & Skoog medium supplemented with 1.75 ppm IAA, 0.2 ppm 2, 4-D and 0.25 ppm kinetin was found to be 0.116 percent. Inclusion of urea in the medium increased the growth index from 30.93 to 57.23 with 15 mg/lit added concentration while the diosgenin content decreased. One month old callus tissue irradiated with 1, 2, 3, 5 & 10 KR doses of gamma rays subcultured and analysed after one month and two months showed decreasing trend of growth indices and diosgenin content. Post harvest incubation of irradiated tissue with sodium azide showed higher (35.5 percent) concentration of diosgenin. Post harvest analysis of irradiated tissue showed 144.4 percent increase in diosgenin content over unirradiated tissue.

9205-2790 Bohlmann, J., Eilert, U.(Institut für Pharmazeutische Biologie der TU, Mendelssohnstr. 1, D-3300 Braunschweig, Federal Republic of Germany) **S-Adenosylmethionine: Anthranilic acid N-Methyltransferase and elicitation response in cell cultures of different Rutaceae.** *Planta Medica*, v. 57(Supplement 2): p. A94-A95, 1991 (5 ref, Eng).

Several enzyme activities increased transiently in the cell cultures of 4 different members of the Rutaceae *Choisya ternata*, *Citrus grandis*, *Dictamnus albus*, *Skimmia japonica* as a result of elicitor treatment, including phenylalanine ammonia lyase (PAL) and 4-coumarate: CoA ligase (4-CL) which catalyse early steps in the biosynthesis of coumarins, and anthranilic acid N-methyl-transferase (NMT) which catalyses the first committed step in acridone alkaloid biosynthesis and possibly in furanoquinoline alkaloid biosynthesis, too. Determination of NMT enzyme activities in extracts of leaves from different members of the Rutaceae family (*C.ternata*, *C.grandis*, *D.albus*, *Murraya paniculata*, *Orixa japonica*, *Phellodendron amurense*, *Poncirus trifoliata*, *Ruta graveolens*, and *S.japonica*) revealed its ubiquitous presence in all plants tested.

9205-2791 Bohlmann, J., Eilert, U.(Institut für Pharmazeutische Biologie der TU Braunschweig, Mendelssohnstrasse 1, D-3300 Braunschweig, Federal Republic of Germany) **Elicitor-induction of chorismate mutase in different in vitro system of *Ruta graveolens*.** *Planta Medica*, v. 57(supplement 2): p. A111-A112, 1991 (7 ref, Eng).

As in other plants, in vitro activity of chorismate mutase (CM) from *R.graveolens* is activated by tryptophan and inhibited by phenylalanine and tyrosine. In the assay system, maximum activity of CM was obtained with 1.5 mM chorismate and 2.0 mM tryptophan. In response to elicitation, fine suspension cultures as well as differentiated in vitro systems of *R.graveolens* showed the same time course of CM activity.

9205-2792 Bonire, J.J., Jalil, N.S., Lori, J.A.(Department of Chemistry, Ahmadu Bello University, Zaria, Nigeria) **Iron, nickel, copper, zinc and cadmium content of two cultivars of white yam (*Dioscorea rotundata*) and their source soils.** *Journal of the Science of Food and Agriculture*, v. 57(3): p. 431-435, 1991 (8 ref, Eng).

The determination by atomic absorption spectroscopy of the iron, nickel, copper, zinc and cadmium content of two cultivars of white yam *D.rotundata* is reported. The analyses show all the metals except Fe to be in trace amounts in the tissues of both cultivars; the barks contain two to four times more. The iron content was found to be about 20 times higher in the bark than in the tissue. Less than 0.7 percent of the metals present in the soil could be extracted with NH_4NO_3 solution. Yam bark, which contains reasonable amounts of the above metals, could be useful as cattle feed. Yam tissue, having a high content of Zn compared with Cd, could be recommended for the diet of hypertensive patients.

9205-2793 Bringmann, G., Pokorny, F., Stablein, M., Govindachari, T.R., Almeida, M.R., Ketkar, S.M.(Institute of Organic Chemistry, University of Würzburg, Am Hubland, D-8700 Würzburg, Federal Republic of Germany) **On the biosynthesis of acetogenic tetrahydroisoquinoline alkaloids: first in vivo feeding experiments.** *Planta Medica*, v. 57(Supplement 2): p. A98, 1991 (7 ref, Eng).

The Indian species *Ancistrocladus heyneanus* from fruits was cultured for biosynthetic experiments. First feeding experiments, using $\{^{14}\text{C}\}$ -labelled compounds like acetic acid and malonic acid, showed a definitive incorporation into ancistrocladine plumbagine, and further constituents of this plant significantly higher than e.g. for phenylalanine.

9205-2794 Burton, H.R., Dye, N.K., Bush, L.P. (Department of Agronomy, University of Kentucky, Lexington, Kentucky 40546-0091, USA) **Distribution of tobacco constituents in tobacco leaf tissue. 1. Tobacco-specific nitrosamines, nitrate, nitrite, and alkaloids.** *Journal of Agricultural and Food Chemistry*, v. 40(6): p. 1050-1055, 1992 (16 ref, Eng).

Leaves from a dark air-cured tobacco variety (Ky 171) were divided into 41 defined leaf segments. All samples were analyzed for nitrate nitrogen, nitrite nitrogen, nicotine, myosmine, normicotine, anabasine, anatabine, N'-nitrosonornicotine (NNN), N'-nitrosoanatabine (NAT), and 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone (NNK). Nitrite concentration was highest at the base of the leaf and decreased toward the tip of the leaf. Concentration of alkaloids was lowest at the base and tip of the leaf and greatest at the periphery of the leaf and decreased toward the tip of the leaf. Individual nitrosamines were lowest at the tip and the periphery of the leaf. Midvein contained lowest concentration of NNN, NNK, and NAT at two-thirds length of the leaf and was highest at the base of the leaf. There appeared to be a better relationship between nitrite nitrogen and tobacco-specific nitrosamines than there was with alkaloid content in the leaf.

9205-2795 Chyau, C.C., Chen, S.Y., Wu, C.M. (Food Industry, Research and Development Institute (FIRDI), PO Box 246, Hsinchu 300, Taiwan, Republic of China) **Differences of volatile and nonvolatile constituents between mature and ripe guava (*Psidium guajava* Linn) fruits.** *Journal of Agricultural and Food Chemistry*, v. 40(5): p. 846-849, 1992 (23 ref, Eng).

During the ripening of guava (*P. guajava*) fruits, the contents of total pectin, total sugars, reducing sugars, and acidity dropped obviously from the mature to the ripe stage, but the Brix-acid ratio increased inversely. Volatile constituents of mature and ripe guava fruits were identified by GC, GC/MS and GC/FT-IR. A total of 34 components were identified, in which 17 components were further identified by authentic compounds. In quantitative distribution, total amounts of 134 mg/kg of mature fruit and 93 mg/kg of ripe fruit were determined. The major constituents in mature fruit were 1,8-cineole, (E)-2-hexenal and (E)-3-hexenal. Ethyl hexanoate and (Z)-3-hexenyl acetate were the major volatile components of ripe fruit.

9205-2796 Colombo, M.L., Tome, F. (Ist.Sc. Farmacologiche, Università di Milano, Milan, Italy) **Growth and alkaloid content in *Eschscholtzia californica* in controlled conditions.** *Planta Medica*, v. 57(Supplement 2): p. A99, 1991 (Eng).

Under all conditions, the reproductive stage was achieved within 60 days after sowing whereas, in contrast, the vegetative growth was greatly affected by environmental conditions. *Eschscholtzia* plants kept under short-day conditions showed aerial parts only 15 cm long and growth resulted in an increased stem thickness. Stem elongation took place in long-day (45-60 cm) or under continuous light accompanied by a reduction in lignified tissues. Aerial parts of plants grown under continuous light accumulated escoline and californidine (major alkaloids), protopine, allocryptopine, sanguinarine, chelerythrine and O-methylcariachine.

9205-2797 Davis, D.A., Tsao, D., Seo, J.H., Emery, A., Low, P.S., Heinsteins, P. (Department of Medicinal Chemistry and Pharmacognosy, Purdue University, West Lafayette, IN 47907, USA) **Enhancement of phytoalexin accumulation in cultured plant cells by oxalate.** *Phytochemistry*, v. 31(5): p. 1603-1607, 1992 (22 ref, Eng).

Oxalate (0.2-2.0 mM), a compound which induces systemic resistance, can enhance secondary product synthesis 10-fold in cotton cell suspension cultures. To accomplish this, cells require induction with a low level (10 micro g of protein per 15 ml incubation) of elicitor from *Verticillium dahliae*. In the presence of oxalate, these minimal concentration of elicitor required to induce phytoalexin formation did not have any necrotic effect on the growth of the cotton cultures. Even at higher concentrations of elicitor (80 micro g of protein per 15 ml incubation), oxalate was able to reduce the detrimental effect of elicitor on cell suspension growth rates indicating oxalate may have a direct effect on growth. Therefore, in cotton cell suspension cultures the addition of an enhancer of elicitor-induced phytoalexin formation allows optimum stimulation of secondary metabolite formation without affecting cell mass accumulation.

9205-2798 De, S., Dave, K.K., Khant, D.B. (Pharmaceutical Chemistry Laboratory, I P G T & R, Gujarat Agricultural University, Jamnagar 361 008, Gujarat, India) **Study on *Eucalyptus* oil.** *Ayu*, v. 12(5): p. 7-12, 1991 (5 ref, Eng).

The volatile oil content was found to be maximum (1.25 percent v/w) in the sample collected in the first week of June and minimum (0.925 percent v/w) in the samples in the first week of November and December. The cineole content was maximum (41.50 percent) in the sample collected in September and minimum (32 percent) in the samples collected in February. Phellandrene content was maximum (3.13 percent) and minimum (0.88 percent), in the samples collected in the first week of January and February respectively.

9205-2799 Demeyer, K., Dejaegere, R. (Institute for Molecular Biology, Vrije Universiteit Brussel, St. Genesius-Rode, Belgium) **Influence of the N-form used in the mineral nutrition of *Datura stramonium* on alkaloid production.** *Planta Medica*, v. 57(Supplement 2): p. A27, 1991 (Eng).

Two different treatments of N form were prepared: in one treatment N was only administered in the NO₃-form, whereas in the other, NO₃ was partly (20 percent) replaced by NH₄. In both treatments, plants received the same total amount of nitrogen as well as the same interanionic and intercationic ratio's. Regarding crop yield, no significant differences were observed between the two treatments, and this was valid for the roots as well as for the leaves and stems. With regard to hyoscyamine, in young plants (4-12 weeks) a higher content was obtained in the upper plant parts when receiving the 100 percent NO₃ treatment. Thereafter the content started to decrease for the NO₃ treatment, whereas for the combined NO₃+NH₄-treatment it still increased until 16 weeks after sowing. As a result, a significantly higher hyoscyamine content was obtained with this combined treatment at the time when the highest biomass yield was reached.

9205-2800 Dube, A., Bharti, S., Laloraya, M.M. (School of Life Sciences, Vigyan Bhanvan, Khandwa Road, Devi Ahilya Vishwavidyalaya, Indore 452001, MP, India) **Inhibition of abscisic acid-induced senescence and anthocyanin synthesis by Co(2+) in leaf disks of *Terminalia catapa* L..** *Indian Journal of Experimental Biology*, v. 30(6): p. 527-529, 1992 (25 ref, Eng).

Absciscic acid given along with sucrose promoted anthocyanin synthesis, phenylalanine ammonia-lyase (PAL) activity, and loss in chlorophyll, protein, and RNA contents. Indoleacetic acid showed no appreciable change in chlorophyll, protein and RNA contents of the leaf disks. However, at higher concentrations it inhibited anthocyanin synthesis and PAL activity to some extent Co(2+) inhibited abscisic acid-induced anthocyanin synthesis, PAL activity, increased protein and RNA contents partially, while chlorophyll content did not show parallel changes.

9205-2801 Fevèreiro, P., Pais, M.S.S., Cabral, J.M.S. (Departamento Biologia Vegetal, Fac. Ciencias Universidade Lisboa, 1700 Lisboa, Portugal) **Production of silybin-like compounds in cell suspension cultures of *Silybum marianum*.** *Planta Medica*, v. 57(Supplement 2): p. A116-A117, 1991 (3 ref, Eng).

S. marianum cell suspension cultures were established in Gamborg's B5 medium. The subculture of *S. marianum* cells in B5 medium in which potassium nitrate was substituted by equal nitrogen molar amounts of

glutamic acid induced production of yellow-reddish compounds in the dark. Some of these compounds were excreted and accumulated in the medium. The production of compounds absorbing at 320 nm was dependent on the initial cell concentration, type and concentration of carbon source, CO₂ concentration, and light. The addition of 1 mM of glyphosate significantly inhibited the production of these compounds.

9205-2802 Flesch, V., Jacques, M., Cosson, L., Teng, B.P., Petiard, V., Balz, J.P. (Laboratoire du Physiologie de Developpement des Plantes, Universite Paris VI, 4, Place Jussieu, Tour 53, E5, Paris, F-75252 cedex 05, France) **Relative importance of growth and light level on terpene content of *Ginkgo biloba*.** *Phytochemistry*, v. 31(6): p. 1941-1945, 1992 (18 ref, Eng).

Growth of young *G. biloba* cultivated in a greenhouse, in natural light at 24-17 degree and evolution of the terpene content (ginkgolides A,B,C,J and bilobalide) in leaves, shoots and roots were observed at the same moments during the first three years of life. Leaves accumulate more terpenes than roots and especially shoots. During one vegetative season, terpene content fluctuated significantly in leaves. When the plants are cultivated in a climate chamber, in constant artificial light with medium photonic flux at the same temperatures, the ginkgolide and bilobalide content in leaves remains low and constant. The level of terpene accumulation in *G. biloba* leaves may be linked to the photonic level and not to leaf or plant growth or to a specific stage of organs.

9205-2803 Gavidia, I., Perez-Bermudez, P., Falco, J.M., Segura, J. (Departamento de Biologia Vegetal, Universidad de Valencia, 46010 Valencia, Spain) **Influence of genotype on micropropagation of adult *Digitalis obscura* plants.** *Planta Medica*, v. 57(Supplement 2): p. A28, 1991 (4 ref, Eng).

Plant materials were collected from populations of *D. obscura* at three different regions of Valencia. The various genotypes used in these experiments were: T2, T4, LL6, LL7, M1, and M2. Meristems isolated from axillary buds were cultured for 45 days; subsequently, developed were transferred to MS without growth regulators. Shoot tips (1 cm in length) isolated from proliferating M2 and LL7 cultures were used to study the effect of changes in the concentration of MS macronutrients on growth and multiplication rates. Major salt changes affected the entire MS formulation (1/2 or 1/4 strength) or the nitrogen source (NO₃- or NH₄+ omitted). Media were supplemented with 5 microM BA and cultures incubated for 45 days. Cardenolide extractions and RIA determinations were performed. The cultures were kept in growth chambers at 26±2 degree C with a 16 h day photoperiod. The prolifera-

tion capacity of *D.obscura* axillary bud cultures was strongly affected by the donor plant and appreciable differences were found in the multiplication rates not only among genotypes from different regions but also between those from the same population. Maximum multiplication rates were obtained with genotypes M2 and LL.

9205-2804 Glowniak, K., Gawron, A., Dragan, T.(Department of Pharmacognosy and Technological Laboratory Medical Academy, Pstrowskiego 12, 20-007 Lublin, Poland) **Furanocoumarins as phytoalexins in *Angelica* roots stressed by fungi.** *Planta Medica*, v. 57(Supplement 2): p. A117, 1991 (5 ref, Eng).

The ability to stimulate synthesis of furanocoumarins in *Angelica archangelica* roots by saprophytic fungi has been reported. Marked changes of the concentrations of furanocoumarins in the *Angelica* roots after 3 days of incubation were observed. Increase in the concentrations of xanthotoxin and bergapten in specimens treated (72 h) with *Trichoderma* F-522 and *Phanerochaete chrysosporium* was noted. A new component - probably pimpinellin - was found in *Angelica* roots incubated with *Aspergillus*. It was formed as the response of the plant tissue as a phytoalexine to the *Aspergillus niger* fungus.

9205-2805 Groeneveld, H.W., Van Tegelen, L.J.P. , Versluis, K. (Department of Plant Ecology and Evolutionary Biology, University of Utrecht, Sorbonnelaan 16, NL-3584 CA Utrecht, The Netherlands) **Cardenolide and neutral lipid biosynthesis from malonate in *Digitalis lanata*.** *Planta Medica*, v. 58(3): p. 239-244, 1992 (31 ref, Eng).

D.lanta plants were grown on water culture in a controlled environment and in the young, growing leaves free sterols (0.335 micromol/g FW), triacylglycerols (0.97 micromol/g FW) and cardenolides(1.82 micromol/g FW) were the major apolar and polar lipids. The cardenolide-containing fraction from these tissues was separated into 26 cardenolides. The 5 major components, lanatosides A and C, acetyldigoxin, acetyldigitoxin, and glucoevatromonoside were identified. Incorporation experiments with {2-14C}-acetate, {2-14C}-malonate, {2-14C}-mevalonate, and {U-14C}-sucrose showed the labelling of all the occurring cardenolides after a 3 day incorporation period. Comparing the simultaneous synthesis of labelled sterols and triacylglycerols, malonate could be considered as the most effective precursor in cardenolide synthesis.

9205-2806 Hammouda, F.M., Ismail, S.I. , Hassan, N.M., Zaki, A.K., Kamel, A. , Rimpler, H.(Pharmaceutical Sciences Department National Research Centre, Dokki 12311, Cairo, Egypt) **Evaluation of the silymarin content in *Silybum marianum* cultivated under different agricul-**

tural conditions. *Planta Medica*, v. 57(Supplement 2): p. A29, 1991 (4 ref, Eng).

The plant *Silybum marianum* was cultivated and subjected to different agricultural treatments including the effect of a water regime 75, 60, and 45 percent per field capacity and nitrogen fertilization levels 0, 50, 100, and 150 kg/feddan. Each treatment was evaluated by an HPLC assay. The results showed a higher percentage of silymarin 63.1 percent, obtained under the 60 percent water regime per field capacity with no nitrogen as fertilizer, while upon treatment of the soil with different nitrogen fertilization levels, no great differences were noticed. However, the 100 kg and 150 kg nitrogen per feddan gave slightly higher silymarin contents (52.2 and 52.8 percent), respectively.

9205-2807 Hanus, L., Subova, D.(Department of Hygiene and Epidemiology, Medical Faculty, Palacky University, Dr S. Allende Street 3, 775 15 Olomouc 5, Czechoslovakia) **Amount of main cannabinoid substances in hemp, cultivated for industrial fibre production and their changes in the course of one vegetation period.** *Acta Universitatis Palackianae Olomucensis(Olomouc), Facultatis Medicae*, v. 122: p. 11-23, 1989 (18 ref, Eng, Cze).

Quantitative variations in the amount of cannabidiol and delta(9)-tetrahydroncannabinol in Czechoslovak hemp (*Cannabis sativa*) var. *Rastislavice*, in the course of vegetation period of 1985 has been studied. The hemp samples collected in 17 vegetation stages were analyzed in fresh as well as in dried state. The analysis was carried out in samples of sexually undistinguished plants (7 vegetation stages), in samples of male plants (3 vegetation stages) and in samples of female plants (10 vegetation stages).

9205-2808 Harmala, P., Lipponen, J. , Fagerstedt, K., Hiltunen, R. , Oksman-Caldentey, K.M.(Pharmacognosy Division, Department of Pharmacy, University of Helsinki, SF-00170 Helsinki, Finland) **Spontaneous somatic embryogenesis of *Peucedanum palustre*.** *Planta Medica*, v. 57(Supplement 2): p. A29-A30, 1991 (5 ref, Eng).

The conventional root cultures of *P.palustre*, cultured in liquid B5 basal medium supplemented with IAA(5.5 x 10⁻⁷M), spontaneously formed callus in the third passage. One of these cultures proved to be embryogenic. The growth conditions of the embryogenic cultures were as follows; temperature-25-28 degree C, humidity from 34-54 percent, and a photo period cycle of 16 hours light (20-30 micgrEs-1m) and 8 hour darkness.

9205-2809 Hensel, A., Hanna, R., MacLachlan, G.(Taunusring 16, D-8755 Alzenau/Ufr.,Federal Republic of Germany) **Auxin-induced metabolism of seed xyloglucan in**

cotyledons of *Tropaeolum majus*. *Planta Medica*, v. 57(Supplement 2): p. A41, 1991 (1 ref, Eng).

Addition of auxin to isolated cotyledons before day 7 did not have any effect on xyloglucan metabolism, implying that cotyledons become receptive to auxin at day 7 to 8. Examination of the breakdown products gave only monomeric sugars; no intermediate size polysaccharides could be detected, indicating a complete metabolism of xyloglucan molecules when attacked once by degrading enzymes.

9205-2810 Holscher, W., Vitzthum, O.G., Steinhart, H. (Institute of Biochemistry and Food Chemistry, University of Hamburg, Grindelallee 117, D-2000 Hamburg, FRG) **Prenyl alcohol-source for odorants in roasted coffee.** *Journal of Agricultural and Food Chemistry*, v. 40(4): p. 655-658, 1992 (18 ref, Eng).

The identification and characterization of the sulfur-containing flavor components 3-methyl-2-buten-1-thiol, 3-mercapto-3-methylbutanol, and 3-mercapto-3-methylbutyl formate are described. The volatiles were isolated by simultaneous distillation/extraction. After pre separation by means of column chromatography, preparative HPLC, and GC, the aroma extracts were investigated by capillary GC, GC-MS, and simultaneous GC/sniffing. Identification was carried out by retention and spectroscopic data. The proposed structures were confirmed by synthesis. The results of sensory trials indicate that these components may contribute to the flavor of roasted coffee. As the identified components are very likely to be related to each other by their common precursor prenyl alcohol (3-methyl-2-buten-1-ol), the formation pathway was investigated by means of model reactions.

9205-2811 Ikegami, F., Horiuchi, S., Kobori, M., Morishige, I., Murakoshi, I. (Faculty of Pharmaceutical Sciences, Chiba University, Yayoi-cho 1-33, Chiba 260, Japan) **Biosynthesis of neuroactive amino acids by cysteine synthases in *Lathyrus latifolius*.** *Phytochemistry*, v. 31(6): p. 1991-1996, 1992 (20 ref, Eng).

Two cysteine synthases (CSases) purified from the aerial parts of *L. latifolius* could catalyze the formation of some heterocyclic-substituted alanines such as (pyrazol-1-yl)-L-alanine from O-acetyl-L-serine (OAS) as additional catalytic activities. CSase isoenzyme A synthesized the neuroexcitatory amino acid L-quisqualic acid in the same manner as the formation of L-quisqualic acid by CSase in *Quisqualis indica* var. *villosa*. Both CSase isoenzymes also catalyzed the formation of the neurotoxic amino acid beta-cyano-L-alanine from OAS and CN⁻. Several properties, including the amino acid compositions of the purified C-

Sases, and the physiological role of these enzymes in higher plants are also described.

9205-2812 Ishimaru, K., Yoshimatsu, K., Yamakawa, T., Kamada, H., Shimomura, K. (Genetic Engineering Laboratory, Faculty of Agriculture, Saga University, 1 Honjo, Saga 840, Japan) **Phenolic constituents in tissue cultures of *Phyllanthus niruri*.** *Phytochemistry*, v. 31(6): p. 2015-2018, 1992 (24 ref, Eng).

Adventitious root, hairy root, shoot and crown gall cultures of *P. niruri* were established and the production of several phenolic compounds was analysed. From hairy roots cultures, six phenolic compounds; gallic acid, (-)-epicatechin, (+)-gallocatechin, (-)-epigallocatechin, (-)-epicatechin 3-O-gallate and (-)-epigallocatechin 3-O-gallate were isolated. Roots of the mother plant cultivated under hydroponic conditions contained almost the same phenolic compounds as those in root cultures. Leaves and stems of the cultivated plant contained hydrolysable tannins such as geraniin, corilagin and galloylglucose which were similarly observed in the plant collected in Peru.

9205-2813 Ishimaru, K., Sadoshima, S., Neera, S., Koyama, K., Takahashi, K., Shimomura, K. (Department of Applied Biological Sciences, Faculty of Agriculture, Saga University, 1 Honjo, Saga 840, Japan) **A polyacetylene gentiobioside from hairy roots of *Lobelia inflata*.** *Phytochemistry*, v. 31(5): p. 1577-1579, 1992 (17 ref, Eng).

From hairy roots of *Lobelia inflata*, cultured in hormone-free Murashige-Skoog liquid medium, a new polyacetylene compound lobetyolinin (9-O-beta-D-gentiobiosyl-2,10-tetradecadien-4,6-diyne-8,14-diol) was isolated and its structure established on the basis of chemical and spectroscopic evidence.

9205-2814 Iwasa, K., Kamigauchi, M., Takao, N. (Kobe Women's College of Pharmacy, Motoyamakita, Higashinada, Kobe 658, Japan) **Transformations of (+)-salsolinol into optically active O-and/or N-methylated derivatives by several Papaveraceae plants and their tissue-cultured cells.** *Journal of Natural Products*, v. 55(4): p. 491-495, 1992 (13 ref, Eng).

(+)-Salsolinol, a substance possibly inducing parkinsonism, was biotransformed into optically active O-and/or N-methylated salsolinols by several Papaveraceae plants and tissue-culture cells derived from these plants. The bioconversion of racemic salsolinol into optically active tetrahydroisoquinolines has never been shown to occur either in animals or in plants.

9205-2815 Jaggi, R.K., Kapoor, V.K. (Department of Pharmaceutical Sciences, Panjab University, Chandigarh 160

014, India) **Factors affecting production of diosgenin in nature.** *Indian Drugs*, v. 29(9): p. 378-386, 1992 (128 ref, Eng).

Work carried out on the factors affecting production of diosgenin in *Dioscorea* species, *Costus speciosus*, *Trigonella foenum-graecum*, *Kallstroemia pubescens*, *Trillium* species, *Balanites aegyptiaca*, *Lycium* species etc. has been reviewed under the following sub-headings: geographical factors, effect of soil and fertilizers, species variations, clonal variations, genotypic variations, age variations, fermentation, exogenous enzymes, effect of growth hormones, effect of precursors and other chemicals, effect of radiations and chemical mutagens, miscellaneous factors.

9205-2816 Jovanovic, V., Grubisic, D., Giba, Z., Menkovic, N., Ristic, M. (Science Center "Petnica", Valjevo, Yugoslavia) **Alkaloids in hairy root cultures of *Anisodus luridus*.** *Planta Medica*, v. 57(Supplement 2): p. A102, 1991 (3 ref, Eng).

The samples of hairy roots culture were lyophilized and used for alkaloids analyses. Tropane alkaloids were identified by TLC, GC, and GC-MS techniques. The content of atropine and scopolamine was determined by capillary gas chromatography using caffeine as internal standard. On the basis of multilevel calibration, values between 158 mg/kg and 724 mg/kg were recorded for atropine. Scopolamine was present at lower quantities (25-197 mg/kg) and in some of the samples was not detected.

9205-2817 Kamal, R., Yadav, R.* (Laboratory of Plant Physiology and Biochemistry, Department of Botany Rajasthan University, Jaipur 302 004, Rajasthan, India) **Growth regulators effect on flavonoid content in *Trigonella polycerata* L. plants.** *Indian Drugs*, v. 29(9): p. 395-398, 1992 (10 ref, Eng).

The enhancement of total flavonoid content (free and bound) had been observed by foliar spray of four growth regulators (GA3, NAA, IAA, 2,4-D). The plants were sprayed at flowering stage twice at an interval of 15 days. The amount of total bound flavonoid was invariably higher in all test samples. The maximum amount of total flavonoid content was in treated samples of GA3 (100 ppm) harvested after 15 days, while minimum was in 2,4,D (10 ppm) harvested after 30 days of first foliar spray.

9205-2818 Kamal, R., Yadav, R. (Plant Physiology and Biochemistry Laboratory, Department of Botany, University of Rajasthan, Jaipur 302 004, Rajasthan, India) **Diosgenin and tigogenin from *Trigonella polycerata* plant parts and callus cultures.** *Indian Drugs*, v. 29(8): p. 360-361, 1992 (11 ref, Eng).

Diosgenin and tigogenin were found to be more in pods, 0.25 percent and 0.180 percent as compared to aerial parts, 0.04 percent and 0.008 percent respectively. The total steroidal content was more in pods (0.43 percent) as compared to aerial parts (0.048 percent). The steroidal content showed parallelism with the growth index (GI) of the tissue. The maximum amount of diosgenin and tigogenin was found in 8 weeks old callus (0.40 percent and 0.15 percent). In *T. polycerata* the presence of two steroidal sapogenins - diosgenin and tigogenin was detected in aerial parts and pods of the plant; however the presence of gitogenin could not be traced.

9205-2819 Kamel, S., Brazier, M., Desmet, G., Fliniaux, M.A., Jacquin-Dubreuil, A. (Laboratoire de Pharmacie Clinique et Biopharmacie, Faculte de Pharmacie, 3, rue des louvels, 80037 Amiens Cedex France) **Glucosylation of butyric acid cell suspension culture of *Nicotiana plumbaginifolia*.** *Phytochemistry*, v. 31(5): p. 1581-1583, 1992 (23 ref, Eng).

Suspension cells of *Nicotiana plumbaginifolia* rapidly absorbed exogenously applied butyric acid and converted it into a new product within one day. The conversion product was found to be 6-O-butyryl-D-glucose. This molecule could be of great interest because of its capacity to transport and release butyric acid *in vivo*.

9205-2820 Lansing, A., Haertel, M., Gordon, M., Floss, H.G. (Department of Chemistry BG-10 University of Washington, Seattle, WA 98195, USA) **Biosynthetic studies on taxol.** *Planta Medica*, v. 57(Supplement 2): p. A83, 1991 (1 ref, Eng).

In order to develop an alternative biological system for the biosynthetic studies, several cell lines of *Taxus brevifolia* have been established in suspension culture. HPLC analysis suggested the production of small amounts of taxol in these cultures. It was also established that these cultures can tolerate at least 20 mg/l of taxol without adverse effects.

9205-2821 Lapena, L., Brisa, C., Segura, J. (Departamento de Biologia Vegetal, University de Valencia, 46010-Valencia, Spain) **Factors affecting somatic embryogenesis from hypocotyl cultures of *Digitalis obscura*.** *Planta Medica*, v. 57(Supplement 2): p. A30-A31, 1991 (4 ref, Eng).

A method to improve embryo production in suspension cultures established from embryogenic hypocotyl calli of *D. obscura* is described. The influence of GA3 on IAA-induced embryogenesis in hypocotyls of this species is also reported.

9205-2822 Loughrin, J.H., Hamilton-Kemp, T.R., Burton, H.R., Andersen, R.A., Hildebrand, D.F. (Department of Horticulture, University of Kentucky, Lexington, KY 40546, USA) **Glycosidically bound volatile components of *Nicotiana sylvestris* and *N.suaveolens* flowers.** *Phytochemistry*, v. 31(5): p. 1537-1540, 1992 (14 ref, Eng).

Glycosides, which were putative precursors of fragrance compounds, were hydrolysed enzymatically and a number of the volatiles released were subsequently identified by GC-MS including compounds not previously identified in the floral headspace of *Nicotiana* species. Average yields of volatiles released from glycosides were ca 230 and 1050 microg g⁻¹ for *N.sylvestris* and *N.suaveolens* flowers, respectively. Compounds in the glycosidically bound fraction were all phenylpropanoid-derived volatiles (e.g. benzyl alcohol, benzaldehyde, E-cinnamyl alcohol, benzyl salicylate) with the exception of the monoterpene alpha-terpinol. However, pronounced differences were obtained in the concentrations of glycosidically bound volatiles at different floral maturity stages.

9205-2823 Matsumoto, T., Cyong, J., Yamada, H. (Oriental Medicine Research Center of the Kitasato Institute, 5-9-1, Shirokane, Minato-ku, Tokyo 108, Japan) **Stimulatory effects of ingenols from *Euphorbia kansui* on the expression of macrophage Fc receptor.** *Planta Medica*, v. 58(3): p. 255-258, 1992 (14 ref, Eng).

Immune complex binding to macrophages was enhanced by treatment with an *E.kansui* extract. Systematic fractionation of the extract led to the characterization of 3-O-(2'E,4'-Z-decadienoyl)- and 3-O-(2,3-dimethylbutyryl)-13-O-n-dodecanoyl-13-hydroxyingenol as the active principles. Immune complex binding to macrophages by the action of these compounds increased in a dose-dependent manner. When each ingenol (10 nM) was added to the separated culture medium, the immune complex binding ability of macrophages increased up to 2-fold, respectively. Scatchard analysis showed the enhanced expression of the Fc-receptor for gamma-globulin by the action of each ingenol to macrophages. This Fc-receptor up-regulation was dependent on RNA synthesis, suggesting a possible de novo synthesis.

9205-2824 Merillon, J.M., Liu, D., Laurent, Y., Rideau, M., Viel, C. (Laboratoire de Biologie Cellulaire et Biochimie Végétale, Faculté de Pharmacie, F 37042 Tours Cedex, France) **Effect of nifedipine on alkaloid accumulation in *Catharanthus roseus* cell cultures.** *Phytochemistry*, v. 31(5): p. 1609-1612, 1992 (25 ref, Eng).

The effect of nifedipine on both alkaloid accumulation and calcium uptake in *C.roseus* cell cultures was

investigated. It was shown that nifedipine inhibited ajmalicine accumulation through a mechanism other than blocking of the calcium channel uptake. Moreover nifedipine was biotransformed into its 4-(2'-aminophenyl)-pyridine derivative.

9205-2825 Mevenkamp, G., Lieberei, R., Ogzewalla, C.D., Harnischfeger, G. (Institut für Angewandte Botanik, Mar-seiller Str.7. D-2000 Hamburg 36, Federal Republic of Germany) **In vitro propagation of *Baptisia tinctoria*.** *Planta Medica*, v. 57(Supplement 2): p. A31, 1991 (4 ref, Eng).

The conditions which allow the rooting of cut shoots and the successful transfer of rooted plants from the in vitro culture to ex vitro conditions in soil were studied. The medium according to Murashige and Skoog (MS) with 1 ppm 6-benzylaminopurine and 3-5 percent sucrose is optimal for shoots proliferation of selected clones. 2 to 4 shoots per explant and subculture were harvested. More than 90 percent of two cut shoots get rooted on rooting medium. The rooting begins 10 days after transfer of the cut shoots on the rooting medium. The rooting process is not influenced by the season and can be carried out throughout the whole year.

9205-2826 Moreno, P.R.M., Poulsen, C., van der Heijden, R., Verpoorte, R. (Project Group Plant Cell Biotechnology Delft-Leiden, Department of Pharmacognosy, Center for bio-Pharmaceutical Sciences, P.O. Box 9502, 2300 RA Leiden, The Netherlands) **Activity of some enzymes of secondary metabolism after elicitation of *Catharanthus roseus* cell cultures.** *Planta Medica*, v. 57(Supplement 2): p. A103, 1991 (3 ref, Eng).

Cell suspension cultures of *C.roseus* were elicited with an autoclaved cell-free filtrate of *Pythium aphanider-matum*. The following enzyme activities were measured: tryptophan decarboxylase (TDC), anthranilate synthase (AS), phenylalanine ammonia lyase (PAL), chorismate mutase (CM), strictosidine synthase (SSR), and strictosidine glucosidase (SG). The alkaloid content was also determined. After elicitation, it was possible to observe an induction of TDC parallel with AS and an increase of tryptamine in the cells. An induction of SSR activity was also observed, but no increase of SG activity was noticed. Ajmalicine levels were not increased if compared with the control. Although an increase in phenolic compounds secreted into the medium was found neither CM nor PAL were induced after the elicitor treatment.

9205-2827 Nitz, S., Spraul, M.H., Drawert, F., Spraul, M. (Institut für Lebensmitteltechnologie und Analytische Chemie der T U M Weihenstephan, W-8050 Freising-Weihenstephan, Germany) **3-Butyl-5,6-dihydro-4H-isobenzofuran-1-one, a sensorial active phthalide in**

parsley roots. *Journal of Agricultural and Food Chemistry*, v. 40(6): p. 1038-1040, 1991 (14 ref, Eng).

The analysis of parsley root *Pteroselinum crispum* revealed the presence of a novel phthalide derivative with low odor threshold. The structure 3-butyl-5,6-dihydro-4H-isobenzofuran-1-one followed from interpretation of MS, GC-FTIR, and NMR spectroscopic data. It can be derived from sedanenolide. Due to its restricted stability, a high-speed countercurrent chromatography isolation and purification method, which allows separation from other phthalides, had to be elaborated.

9205-2828 Oksman-Caldentey, K.M., Sevon, N., Hiltunen, R. (Pharmacognosy Division, Department of Pharmacy, University of Helsinki, Fabianinkatu 35, SF-00170 Helsinki, Finland) **Hyoscyamine accumulation in hairy roots of *Hyoscyamus muticus* in response to chitosan.** *Planta Medica*, v. 57(Supplement 2): p. A105, 1991 (3 ref, Eng).

Treated hairy roots were found to accumulate hyoscyamine at higher levels (2.5-3 fold) than untreated control cultures. The amount of accumulation varied with elicitor concentration and period of incubation. A significant portion of the hyoscyamine was released into the medium by the highest concentration of chitosan. Maximum elicitation was obtained using a chitosan concentration of 50 mg/l and 500 mg/l, the total hyoscyamine content reaching 400-500 microg/flask within 24 hours. The hairy roots elicited with 500 mg/l chitosan also exhibited the fastest response to elicitor.

9205-2829 Pasha, M.K., Ahmad, F. (Section of oils and Fats, Department of Chemistry, Faculty of Science, and Department of Biochemistry, Faculty of Life Sciences, Aligarh Muslim University, Aligarh 202 002, UP, India) **Analysis of triacylglycerols containing cyclopropene fatty acids in *Sterculia foetida* (Linn.) seed lipids.** *Journal of Agricultural and Food Chemistry*, v. 40(4): p. 626-629, 1992 (25 ref, Eng).

The distribution of cyclopropene acyl moieties in triacylglycerols of *Sterculia foetida* seed lipids was determined after conversion into oxo derivatives which are stable under GLC conditions and readily separated. The triacylglycerols after derivatization were analyzed by spectroscopic and chromatographic techniques. It was found that the triacylglycerols of *S.foetida* seed lipids are composed of four types of molecular species I-IV in the ratio 6:41:33:20, respectively. The minor molecular species I contains common long-chain acyl moieties without a cyclopropene ring. The molecular species II, III, and IV were shown to have one, two, and three cyclopropene acyl moieties, respectively.

9205-2830 Perellino, N.C., Malyszko, J., Ballabio, M., Gioia, B., Minghetti, A. (Analytical Chemistry, Farmitalia C. Erba, Via dei Gracchi 35, 20146 Milano, Italy) **Directed biosynthesis of unnatural ergot peptide alkaloids.** *Journal of Natural Products*, v. 55(4): p. 424-427, 1992 (6 ref, Eng).

Three unnatural lysergic derivatives belonging to the class of ergopeptides were obtained by feeding L-norvaline to a strain of *Claviceps purpurea*. Ergorine corresponds to an analogue of ergovaline, and ergonorine is an analogue of ergocornine; both have at C-5' an n-propyl substituent instead of an isopropyl group. Ergonornorine has the n-propyl group at C-2' as well. This alkaloid represents the first example of an ergopeptide having an unnatural amino acid in the first position of the cyclol moiety. Additional feeding experiments with natural and unnatural amino acids indicated the maximum possible size of the substituent in the first position of the peptide moiety.

9205-2831 Portsteffen, A., Drager, B., Nahrstedt, A. (Institut für Pharmazeutische Biologie und Phytochemie, Westfälische Wilhelms-Universität Münster, Hittorfstr.56, D-4400 Münster, Federal Republic of Germany) **Isolation of two tropinone reductases from *Datura stramonium* root cultures.** *Planta Medica*, v. 57(Supplement 2): p. A107, 1991 (3 ref, Eng).

The reduction of tropinone (tropane-3-one) to tropine (tropane-3 α -ol) is an important step in the biosynthesis of tropane alkaloids. From enzyme preparations of transformed root cultures of *Datura stramonium*, two different tropinone reducing enzymes (TR) were isolated and characterized. Characterization of both enzymes shows (i) differences to tropinone reductases published so far from *D.stramonium*, *D.innoxia* and *Hyoscyamus niger*, and (ii) differences between the individual enzyme proteins.

9205-2832 Prakash, D., Misra, P.N., Misra, P.S. (National Botanical Research Institute, Lucknow 226 001, UP, India) **Variation in protein and trypsin inhibitor activity with maturity and amino acid composition of winged bean (*Psophocarpus tetragonolobus*) seeds.** *Journal of the Science of Food and Agriculture*, v. 57(5): p. 623-626, 1991 (10 ref, Eng).

The protein and trypsin inhibitor activity in pods and seeds of *P.tetragonolobus* increase, and in the pod hull decrease, with the maturity of plant. The seeds of 21 cultivars both exotic and of Indian origin cultivated on marginal alkaline soil (pH 8.7) were analysed for protein (36.4-45.3) and amino acid composition (lysine 4.8 to 6.7).

9205-2833 Prakash, D., Pal, M. (Protein Chemistry Laboratory, National Botanical Research Institute, Luck-

now 226 001, UP, India) **Nutritional and antinutritional composition of vegetable and grain Amaranth leaves.** *Journal of the Science of Food and Agriculture*, v. 57(4): p. 573-583, 1991 (17 ref, Eng).

The foliage of 61 accessions of *Amaranthus* comprising both the grain and vegetable types referable to 10 species were evaluated for carotenoid, protein, nitrate, oxalate and moisture contents (fresh weight). Carotenoid varied from 90 to 200 mg/kg in vegetable types and from 60 to 200 mg/kg in the leaves of grain types. Variation for leaf protein was found to be 14-30, 15-43 g/kg; nitrite 1.8-8.8, 4.1-9.2 g/kg; oxalate 5.1-19.2, 3-16.5 g/kg; and moisture 780-860, 750-840 g/kg in vegetable and grain types, respectively. Analysis of the amino acid composition of leaf protein of some high carotenoid lines revealed a well balanced composition with high lysine (40-56 g/kg).

9205-2834 Purohit, M., Datta, A., Srivastava, P.S. (Department of Botany, Faculty of Science, Jamia Hamdard, Hamdard Nagar, New Delhi 110 062, India) **Opium poppy-Recent trends towards its improvement.** *Hamdard Medicus*, v.35(1):p.6-93, 1992 (32 ref, Eng).

Improvement of *Papaver somniferum* and *P.bracteatum* through tissue culture, alkaloid contents and biological activities have been discussed.

9205-2835 Ramos-Valdivia, A., van der Heijden, R., Verpoorte, R. (Biotechnology Division of Pharmacognosy, Center of Bio-Pharmaceutical Sciences, P O Box 9502, 2300 RA Leiden, The Netherlands) **Isopentenyl diphosphate isomerase activity in elicited Cinchona robusta cell suspension cultures.** *Planta Medica*, v. 57(Supplement 2): p. A127-A128, 1991 (2 ref, Eng).

After elicitation of *C.robusta* cell suspension cultures with a *Phytophthora cinnamomi* preparation, a rapid accumulation of anthraquinones was observed. IPP-isomerase activity in the elicited cultures showed two peaks. The maximum in IPP-isomerase activity coincided with the lowest activity of this enzyme in control cultures. Prenyltransferase activity was inhibited in elicited cultures. Various factors affecting IPP-isomerase activity in desalted *C.robusta* extracts have been discussed.

9205-2836 Rao, D.V.R., Sreehari, D., Thimma Reddy, N., Reddy, K.S. (S V Agricultural College, Tirupati 517 502, AP, India) **Influence of certain plant growth regulators on growth, tuberization and rhizome yield of turmeric (*Curcuma longa* L.) - A note.** *Progressive Horticulture*, v. 21(3-4): p. 194-197, 1989 (Recd.1992; 11 ref, Eng).

Vegetative growth, maturity and yields of fresh rhizomes of *C.longa* were influenced by the growth regulators. Application of NAA and 2,4-D at 10-20 ppm.

significantly improved the pseudostem height, leaf number, and leaf area per plant. The higher concentrations of NAA and 2,4-D (15-20 ppm) reduced the crop duration by 8-13 days and enhanced rhizome filling rate compared to control. NAA 20 ppm increased the per hectare rhizome yield (22.11 t/ha) followed by 2,4 D(20 ppm) (20-92 t/ha). NSL, New Delhi.

9205-2837 Remani, P., Bhattathiri, V.N., Ankathil, R., Vijayakumar, T. (Regional Cancer Center, Tiruvananthapuram 695037 Kerala, India) **Jack fruit lectin, properties and biological applications.** *Aryavaidyan*, v. 5(4): p. 213-218, 1992 (35 ref, Eng).

Jackfruit lectin (JFL), an N-acetyl D-galactosamine specific lectin, isolated from the seeds of jackfruit (*Artocarpus integrifolia*) has two identical sub-units of molecular weight 11,500 and 15,000 and has potent mitogenic activity for T-cells. When conjugated with horse-raddish peroxidase JFL was shown to possess different staining towards normal, benign, premalignant and malignant tissues. JFL have the ability to bind carbohydrate components of cell membrane. This property of JFL can be used to identify the structural differences between normal and malignant cell. NSL, New Delhi.

9205-2838 Roddick, J.G., Rijnenberg, A.L., Weissenberg, M. (Department of Biological Sciences, University of Exeter, Exeter, UK) **Alterations to the permeability of liposome membranes by the solasonine-based glycoalkaloids solasonine and solamargine.** *Phytochemistry*, v. 31(6): p. 1951-1954, 1992 (23 ref, Eng).

Solamargine was consistently the more active compound and caused major lysis of cholesterol-, stigmasterol- and ergosterol-containing liposomes, while solasonine was without effect on cholesterol liposomes and only slightly disruptive to stigmasterol and ergosterol liposomes. Liposomes lacking sterols were not lysed by either compound. In vitro, solamargine also bound effectively with all three sterols, but solasonine did so only with cholesterol and to a lesser degree than solamargine. Both glycoalkaloids, but especially solamargine, caused greater leakage from cholesterol liposomes when the sterol level was increased. Findings are compared with similar properties of the structurally related, but solanidine-based, glycoalkaloids of potato, solanine and chaconine.

9205-2839 Rucker, G., Kiefer, A., Breuer, J. (Pharmazeutisches Institute, Universitat Bonn, Kreuzbergweg 26, D(W)-5300 Bonn I, Federal Republic of Germany) **Isoachifolidiene, a precursor of guaianolide peroxides from *Achillea millefolium*.** *Planta Medica*, v. 58(3): p. 293-295, 1992 (5 ref, Eng, Ger).

Only title translated.

9205-2840 Sauerwein, M., Shimomura, K. (Institut für Pharmazeutische Biologie, Im Neuenheimer Feld 364, D-6900 Heidelberg, Federal Republic of Germany) **Secondary metabolites in green hairy root cultures.** *Planta Medica*, v. 57(Supplement 2): p. A10-A11, 1991 (3 ref, Eng).

The cultured hairy roots of *Amsonia elliptica* produced the same indole alkaloids as the normal root cultures and the mother plants but at a lower level. The growth of hairy roots cultured in the dark and in 16 h light turned green was compared. In both the cultures 17 α -O-methylyohimbine was detectable in trace amount and pleiocarpamine as the main alkaloid. The hairy roots of *Lippia dulcis* turned green produced sweet sesquiterpene hernandulcin together with 20 other mono- and sesquiterpenes.

9205-2841 Sauerwein, M., Shimomura, K. (Institut für Pharmazeutische Biologie, Im Neuenheimer Feld 364, D-6900 Heidelberg, Federal Republic of Germany) **Production of tropane alkaloids in *Hyoscyamus albus* transformed with *Agrobacterium rhizogenes*.** *Planta Medica*, v. 57(Supplement 2): p. A108-A109, 1991 (5 ref, Eng).

One piperidone and 8 tropane alkaloids were isolated from hairy roots. Production of the 5 main tropane alkaloids, 7 β -hydroxyhyoscyamine, 6 β -hydroxyhyoscyamine, scopolamine, hyoscyamine and littorine, in those hairy roots under various culture conditions have been examined by HPLC. Half-strength MS and Gamborg B5 media containing 3 percent sucrose gave the highest alkaloid content (ca. 2 percent dry wt.), but only poor growth. On the other hand, fast growth was observed in WP medium containing 8 percent sucrose, while the production of tropane alkaloids was relatively low.

9205-2842 Schink, M., Moser, D. (Institut für Genetik, Universität Hohenheim, Garbenstr. 30, D-7000 Stuttgart 70, Federal Republic of Germany) **Subspecies-specific differences in the protein pattern and lectin content of *Viscum album*.** *Planta Medica*, v. 57(Supplement 2): p. A42, 1991 (6 ref, Eng).

The differences in the general protein pattern as well as in the lectin content of *V. album ssp. album*, *ssp. austriacum* and *ssp. abietis* have been reported.

9205-2843 Schripsema, J., Verpoorte, R. (Biotechnology Delft-Leiden, Project Group Plant Cell Biotechnology, Division of Pharmacognosy, Center for Bio-Pharmaceutical Sciences, Leiden University, Gorlaeus Laboratories, PO Box 9502, NL-2300 RA Leiden, The Netherlands) **Search for factors related to the indole alkaloid production in**

cell suspension cultures of *Tabernaemontana divaricata*. *Planta Medica*, v. 58(3): p. 245-249, 1992 (21 ref, Eng).

Three strains derived from one cell line of a suspension culture of *T. divaricata* were obtained by subculturing on three different media: i) Strain A: normal MS-medium, ii) Strain S: medium in which the carbon source was starch instead of sucrose, and iii) Strain N: medium in which the ammonium/nitrate ratio was changed from 1:2 to 1:1. The alkaloid contents, the dissimilation curves, morphology, intracellular carbohydrates, and free amino acid pools of all three strains were determined and compared with each other. The observed differences are discussed and evidence is provided that the differences are not caused by genetic instability.

9205-2844 Schussler, M., Fricke, U., Nikolov, N., Holzl, J. (Institut für Pharmazeutische Biologie der Universität Marburg, Deutschhausstr. 17 1/2, D-3550 Marburg/Lahn, Federal Republic of Germany) **Comparison of the flavonoids occurring in *Crataegus* species and inhibition of 3',5'-cyclic adenosine monophosphate phosphodiesterase.** *Planta Medica*, v. 57(Supplement 2): p. A133, 1991 (Eng).

Hyperoside and chlorogenic acid are found in all five species. Moreover, *C. monogyna* and *C. laevigata* contain vitexin rhamnoside, another quercetin glycoside and eridictol glycoside. Furthermore, a blue fluorescing substance (not yet identified) was seen in *C. monogyna* which was missing in *C. laevigata*. The other species, *C. pentagyna* and *C. azarolus* also showed this substance but not the eridictol glycoside. The chromatograms of *C. pentagyna* and *C. nigra* exhibited two yellow zones of luteolin glycosides. *C. pentagyna* contains rutin and vitexin rhamnoside whereas the chromatogram of *C. azarolus* just shows the zone of rutin. Of all the substances investigated, the methanolic leaf extract was found to be the most effective inhibitor of the enzyme. The aqueous extract of leaves and flowers showed a comparable effect. Hyperoside as an O-glycoside showed the highest potency whereas the C-glycosides were less potent inhibitors.

9205-2845 Sefton, M.A., Winterhalter, P., Williams, P.J. (Australian Wine Research Institute, PO Box 197, Glen Osmond, SA 5064, Australia) **Free and bound 6,9-dihydroxymegastigm-7-en-3-one in *Vitis vinifera* grapes and wine.** *Phytochemistry*, v. 31(5): p. 1813-1815, 1992 (14 ref, Eng).

4-Hydroxy-4-(3-hydroxy-1-butenyl)-3,3,5-trimethylcyclohexanone (6,9-dihydroxymegastigm-7-en-3-one) was synthesized from vomifolol and was identified for the first time as a common constituent of *Vitis vinifera* grapes

in both free and conjugated forms, as well as a minor constituent of French and American oakwood extracts.

9205-2846 Suarez, M., Duque, C. (Departamento de Quimica, Universidad Nacional de Colombia, Apartado Aereo 14490, Bogota, Colombia) **Change in volatile compounds during lulo (*Solanum vestissimum* D.) fruit maturation.** *Journal of Agricultural and Food Chemistry*, v. 40(4): p. 647-649, 1992 (14 ref, Eng).

Variation in the levels of the volatile constituents during maturation of lulo *Solanum vestissimum* was investigated. Maturation was characterized by a significant increase in the amount of esters, mainly butyl acetate, methyl(E)-2-butenate, 3-methylbutyl acetate, methyl(E)-2-butenate, methyl hexanoate, (Z)-3-hexenyl acetate, and methyl benzoate. A significant increase in linalool and alpha-terpineol concentrations was also observed, as well as a moderate increase in geraniol, hotrienol, and nerol concentrations. (Z)-3-Hexenol only increased significantly after the fourth maturation stage. In contrast, beta-myrcene, limonene, and terpinolene showed a slight decrease in their concentrations with increasing maturation. Detected aliphatic hydrocarbons showed irregular variations in their concentration and aldehydes a slight increase.

9205-2847 Szoke, E., Mensi, F.S., Oroszlan, P., Petri, G. (Semmelweis University of Medicine, Institute of Pharmacognosy, Budapest, Hungary) **Furanocoumarin and chromone production in tissue cultures of *Ammi majus* and *A.visnaga*.** *Planta Medica*, v. 57(Supplement 2): p. A132-A133, 1991 (3 ref, Eng).

The formation of furanocoumarins (xanthotoxin, bergapten, imperatorin) and chromones (khellin, visnagin) was measured by spectroscopic and chromatographic methods in *Ammi majus* and *Ammi visnaga* intact plants and in their various (suspension, callus, and organized) cultures. The presence of ethrel promoted the formation of callus and that of CCC led to organogenesis in tissue cultures. The medically used xanthotoxin content of organized *A.majus* cultures was considerably increased by CCC. In callus cultures the amount of xanthotoxin could be enhanced by IAA. In *A.visnaga* organized cultures, CCC promoted the biosynthesis of visnagin and the level of khellin in callus cultures was higher than that of visnagin. The formation of visnagin in the cultures could be promoted by NAA.

9205-2848 Tanabe, M., Yasuda, M., Adachi, Y., Ujita, K., Kano, Y. (Nagakura Pharmaceutical Co., Ltd., 1-7-16 Shotenshita, Nishinari-ku, Osaka 557, Japan) **Growth of Japanese "Kintoki Ginger" and contents of pungents and diterpenes.** *Shoyakugaku Zasshi*, v. 46(1): p. 30-36, 1992 (7 ref, Eng, Jap).

Seasonal variations of pungent and diterpene contents in the small type Japanese ginger "Kintoki" (*Zingiber officinale* var. *rubens*) were studied by HPLC. The amounts of pungents {6-gingerol (6-G), 8-gingerol (8-G) and 10-gingerol (10-G)} and diterpenes {(E)-8beta,17-epoxylabd-12-ene-15,16-dial and galanolactone in the unripe childrhizomes, harvested in June and August were small, which reached their maxima in October-December. The pungent compound content of mother-rhizome did not change much throughout the year: it remained at its high level from April (planting period) to October. The amount of diterpenes in mother-rhizome, however, reached its maximum in August.

9205-2849 Tanabe, M., Yasuda, M., Adachi, Y., Kano, Y. (Nagakura Pharmaceutical Co., Ltd., 1-7-16 Shotenshita, Nishinari-ku, Osaka 557, Japan) **Seasonal variation of flavor components in Japanese "Kintoki Ginger".** *Shoyakugaku Zasshi*, v. 46(1): p. 37-41, 1992 (7 ref, Eng, Jap).

The monoterpene and sesquiterpene contents of unripe child-rhizomes of Kintoki (*Zingiber officinale* var. *rubens*), harvested in June and August were found to be small which reached their maxima in October-December. In October, the usual harvest time, the total essential oil content was the highest in the 4th branching rhizome, and then came the 3rd, 2nd, mother, 1st and central rhizomes in order of decreasing content. In the mother-rhizome, its flavor component contents did not change much throughout the year, though its alpha-zingiberene (main sesquiterpene) content slowly decreased. Geranylacetate existed only in newly branched rhizomes, and was considered to be a special compound whose content varied inversely as the plant age.

9205-2850 Tomas, J., Camps, F., Claveria, E., Coll, J., Mele, E., Messeguer, J. (Department of Biological Organic Chemistry, CID-CSIC, Jordi Girona 18, 08034-Barcelona, Spain) **Composition and location of phytoecdysteroids in *Ajuga reptans* in vivo and in vitro cultures.** *Phytochemistry*, v. 31(5): p. 1585-1591, 1992 (35 ref, Eng).

The location and concentration of phytoecdysteroids in *Ajuga reptans* have been studied in different normally grown or *in vitro* micropropagated plants. Some callus cultures were also studied. The relationship of phytoecdysteroid relative concentration with growing conditions and source of tissue are discussed. The ratio of C28/C29 phytoecdysteroids was established amongst the four major compounds (29-norsengosterone and 29-norcyasterone as C28, and cyasterone and ajugalactone as C29) which between them account, on average, for 92 percent of the total phytoecdysteroid content. Micropropagated plants had an

extremely low phytoecdysteroid content in leaves, whereas that in roots was the highest detected in this experiments.

9205-2851 Tumova, L., Dusek, J., Socha, J., Hubik, J. (Katedra Farmakognozie Farmaceuticke Fakulty Univerzity Karlovy, Heyrovskoho 1203, 50165 Hradec Kralove, Czechoslovakia) **Tissue culture of *Ononis arvensis* L. in vitro- New types of growth regulators.** *Ceskoslovenska Farmacie*, v. 40(8-10): p. 234-235, 1991 (3ref, Cze, Eng).

The newly tested growth regulators-2-amino-4-hydroxy-6-methylpyrimidine (regulator I) and 8-(2-diethylaminoethoxy) quinoline (regulator II)-markedly inhibited the growth of culture and they did not prove themselves useful in the establishment of the primoculture either. Qualitative evaluation of flavonoids did not show any change in their composition in comparison with the initial culture. Regulator II increased the content of flavonoids in comparison with NAA and regulator I did it in a statistically significant manner.

9205-2852 Vanek, T., Valterova, I., Vaisar, T., Hamplova, M., Macek, T. (Institute of Organic Chemistry and Biochemistry, Czechoslovak Academy of Sciences, Fleminggovonam 2, 16610 Praha 6, Czechoslovakia) **Biotransformation of citronellal by *Solanum aviculare* plant cells: Preparation of allelopathic (+)-p-menthane-3,8-diols.** *Planta Medica*, v. 57(Supplement 2): A89-A90, 1991 (1 ref, Eng).

Biotransformation of citronellol (1) by means of horseradish peroxidase with aim to prepare 'rose oxide' was described. *S. aviculare* cells transformed citronellal to (+)-p-methane-3,8-cis-diol and the correspondings trans + isomer. Both of these compounds exhibited allelopathic effect.

9205-2853 Vincieri, F.F., Mulinacci, N., Mazzi, G., Coran, S.A., Alberti, M.B. (Dipartimento di Scienze Farmaceutiche, Univerista degli Studi di Firenze, Via Gino Capponi 9, 1-50121-Firenze, Italy) **Evaluation of in vitro bioavailability of *Oenanthe aquatica* fruit tincture-beta-cyclodextrin microinclusion complex.** *Planta Medica*, v. 57(Supplement 2): p. A63-A64, 1991 (5 ref, Eng).

A new solid *O. aquatica* tincture (OAT) and beta cyclodextrin (beta C D) was obtained in which the most active principles, polyacetylene and terpenes are included in beta-CD and, lignans and steroids, are present as a physical mixture. To evaluate bioavailability of OAT the passage through a lipid memberane of the tincture as a complex and of the tincture as such was compared in vitro. This in vitro test is indicative of what may happen in vivo during passage through biological membranes, and may also constitute a good bioavailability index of OAT.

9205-2854 Vozari-Hampe, M.M., Viegas, C., Saucedo, C., Rosseto, S., Manica, G.G., Hampe, O.G. (Departamento de Bioquimica and Departamento de Biofisica, Instituto de Biociencias, UFRGS, 90049 Porto alegre, RS, Brazil) **A lectin from *Sechium edule* fruit exudate.** *Phytochemistry*, v. 31(5): p. 1477-1480, 1992 (18 ref, Eng).

A lectin from the exudate of *Sechium edule* fruit (Chayote) was purified by ammonium sulphate precipitation followed by gel filtration on Sephadex G-100 column and by affinity chromatography on fetuin-agarose. The lectin consists of two identical non-covalently bound subunits and has a mean Mr value of 44000 evaluated by SDS-PAGE without preboiling the sample. The Mr of the subunit was estimated as 22000. The lectin is not glycosylated and it does not require Ca²⁺ and Mg²⁺ for agglutinating activity toward erythrocytes from human and other animal species. The hemagglutinating activity is strongly inhibited by chitin oligosaccharides but not by N-acetyl-D-glucosamine. This lectin is not mitogenic towards human peripheral blood lymphocytes and comprises about 9.5 percent of the exudate proteins.

9205-2855 Weathers, P.J., Fadzillah, N. A.M., Cheetham, R.D. (Worcester Polytechnic Institute, Worcester, MA 01609, USA) **Light inhibits the formation of capsaicin from *Capsicum* callus.** *Planta Medica*, v. 58(3): p. 278-279, 1992 (7 ref, Eng).

Capsicum annuum var. *jalapeno* callus was established from hypocotyl sections of seedlings for 7 days at 4 different light intensities: 0, 270, 570, 1140 micro mol m⁻² S-1 from cool white fluorescent lights. As light intensity increases, the production of capsaicin decreases regardless of the culture medium employed and regardless of whether the medium was replaced daily or not.

9205-2856 Wheeler, N.C., Jech, K., Masters, S., Brobst, S.W., Alvarado, A.B., Hoover, A.J., Snader, K.M. (Weyerhaeuser Research Center, 505 North Pearl St., Centralia, Washington 98531, USA) **Effects of genetic, epigenetic, and environmental factors on taxol content in *Taxus brevifolia* and related species.** *Journal of Natural Products*, v. 55(4): p. 432-440, 1992 (18 ref, Eng).

The demand for taxol, a promising cancer chemotherapeutic agent, far exceeds supply. Presently, taxol is derived from the bark of the Pacific yew, *Taxus brevifolia*, a small, slow-growing evergreen tree native to the northwestern United States. Analytical determinations of taxol, cephalomannine, and baccatin III in more than 200 trees representing several populations of *T. brevifolia* and other yew taxa indicate that (1) significant variation in taxane content exists among and within populations and species, (2) taxol levels exceeding those reported for

T.brevifolia bark were found in shoots of individual trees from most taxa studied, and (3) the season in which samples are collected and handling procedures can influence taxane content.

9205-2857 Woerdenbag, H.J., Pras, N., Alfermann, A.W.(Department of Pharmacognosy, University Centre for Pharmacy, Ant. Deusinglaan 2, NL-9713 AW Groningen, The Netherlands) **Production of artemisinin in shoot cultures of *Artemisia annua*.** *Planta Medica*, v. 57(Supplement 2): p. A91-A92, 1991 (2 ref, Eng).

From *A.annua* seeds of Chinese origin, shoot cultures were initiated in a MS medium supplemented with salts and vitamins. Shoot cultures, obtained from 5 different seedlings, were analysed by GC for their artemisinin contents. In the spent medium, these compounds could not be detected. The highest artemisinin content nearly 0.01 percent of dry weight was obtained with 4 percent sugar. The artemisinin contents in shoot cultures were about 10 fold less than in the intact plant, but shoot cultures may offer better perspectives than undifferentiated cell cultures.

9205-2858 Wysokinska, H., Swiatek, L.(Department of Botany, Institute of Environmental Research and Bioanalysis, Medical Academy, Muszynskiego 1, PL-90-151 Lodz, Poland) **Iridoids from tissue cultures of *Penstemon serrulatus*.** *Planta Medica*, v. 57(Supplement 2): p. A92, 1991 (4 ref, Eng).

The alcoholic extract from calli and suspension-cultured cells of *P.serrulatus* was chromatographed to distinguish between less and more polar compounds. Aglycones of penstemide and serrulatolide were isolated and identified from the apolar fraction. The polar fraction afforded, beside penstemide and serrulatolide, a mixture of penstemide and 7-deoxy-8-epi-valerosides.³ The mixture was acetylated in anhydrous pyridine and two compounds, the pentaacetate of penstemide and the tetraacetate of 3(3a), were isolated. The structure of 3a has been determined on the basis of its spectral data. 7-Deoxy-8-epi-valeroside (3) has not been isolated from nature as yet. This is also the first report of penstemide and serrulatolide aglycones isolated from plant tissue cultures.

9205-2859 Yabuki, N., Ashihara, H. (Department of Biology, Faculty of Science, Ochanomizu University, 2-1-1, Otsuka, Bunkyo-ku, Tokyo, 112, Japan) **AMP Deaminase and the control of adenylate catabolism in suspension-cultured *Catharanthus roseus* cells.** *Phytochemistry*, v. 31(5): p. 1905-1909, 1992 (34 ref, Eng).

AMP deaminase (EC 3.5.4.6) was partially purified from suspension-cultured *C.roseus* cells. The enzyme required ATP for activity and ATP affected both its K_m and

the V_{max} of the reaction. The K_a value for ATP was 0.6 mM, and the K_m value of the enzyme for AMP was 0.6 mM in the presence of 1 mM ATP. GTP was a potent inhibitor of the activity, but none of the catabolites of AMP influenced this. The maximum level of AMP deaminase was found in cells at the early logarithmic phase of growth.

Pharmacognosy

9205-2860 Bisht, R.S., Chamoli, G.P., Makhloga, P.S., Mishra, G.C., Ghildiyal, V., Ghildiyal, J.C.(Department of Chemistry, Government Post Graduate College, Uttarkashi 249 193, UP, India) **Screening of high altitude flora of Garhwal Himalaya for fluorescent medicinal compounds.** *Indian Drugs*, v. 29(8): p. 330-334, 1992 (14 ref, Eng).

Presence of coumarins, flavonoids, steroids, triterpenoids and xanthenes through phytochemical screening of twenty seven unexplored plants having medicinal or toxic properties, has been reported.

9205-2861 Deniel, M., Wichtl, M.(Institut für Pharmazeutische Biologie, Universität Marburg, D-3550 Marburg, Federal Republic of Germany) **A comparative examination of rhizomes from *Urtica kioviensis* and *Urtica dioica*.** *Planta Medica*, v. 57(Supplement 2): p. A69-A70, 1991 (7 ref, Eng).

Microscopic characteristics were studied to distinguish the rhizomes of the two species. Both rhizomes contained fibrous bundles and collenchymatic tissue; calcium oxalate crystals are common in both species of *Urtica*. The roots of both *Urtica* species contained the same steroids, beta-sitosterin and sitosterin-glucoside, as well as the coumarin scopoletin substances which are reported to be characteristic for *U.dioica*, *U.kioviensis* additionally contained a compound with intense fluorescence in UV 365.

9205-2862 Hifnawy, M.S., Muhtadi, F.J., Abdul Hameed, K.U., Shihata, A.A.(Department of Pharmacognosy, KSU, P O Box 2457, Riyadh 11451, Saudi Arabia) **Pharmacognostical and microchemical investigations of *Lygos raetam* Forssk..** *Hamdard Medicus*, v. 35(1): p. 47-60, 1992 (11 ref, Eng).

Macro- and microscopical characters and alkaloid contents of *Lygos raetam*, a poisonous plant growing in Saudi Arabia have been reported.

9205-2863 Joshi, G.C., Tewari, K.C., Pandey, G.(Amalgamated Units, CCRAS, Tarikhet, Ranikhet, 263663, UP, India) **A review of indigenous system of medicine with special reference to herbal drugs.** *Aryavaidyan*, v. 5(3): p. 173-179, 1992 (9 ref, Eng).

A list of some drugs (herbal drugs), exclusively exotic in origin and currently imported, which needs to be introduced in the country has been briefly reviewed. NSL, New Delhi.

9205-2864 Lamaison, J.L., Petitjean-Freytet, C., Carnat, A. (Laboratoire de Pharmacognosie et Phytotherapie, Faculte de Pharmacie, Universite d'Auvergne, 28 Place Henri-Dunant, F 63000 Clermont-Ferrand, France) **Violet flowers: Comparative study of *Viola lutea* Huds., *V. calcarata* L. and *V. odorata* L..** *Plantes Medicinales et Phytotherapie*, v. 25(2-3): p. 79-88, 1991 (24 ref, Eng, Fre).

Dried flowers of *V. lutea*, *V. calcarata* and *V. odorata* were distinguished by their botanical characters and by chemical composition. The contents of main constituents average respectively: anthocyanins (6.1, 2.6 and 4.0 percent), total flavonoids (4.6, 4.0 and 1.1 percent), rutoside (1.8, 0.8 and 0.4 percent), mucilage (20.6, 18.2 and 18.0 percent), ashes (7.5, 6.6 and 8.5 percent). The interest of the substitution of *V. odorata* flowers by *V. lutea* and *V. calcarata* flowers is discussed.

9205-2865 Noro, Y., Hisata, Y., Okuda, K., Kawamura, T., Higuchi, Y., Tanaka, T. (Faculty of Pharmacy, Meijo University, 150, Yagotoyama, Tenpaku-ku, Nagoya 468) **Pharmacognostical studies of *Catalpae Fructus* (1) Relation between the growth of fruit and the iridoid glycoside contents.** *Shoyakugaku Zasshi*, v. 46(1): p. 14-18, 1992 (12 ref, Eng, Jap).

For the quality evaluation of the crude drug *Catalpae Fructus*, the amounts of the iridoid glycosides, i.e. of catalposide and catalpol in the fruits of *Catalpa* spp. and the commercially obtained *Catalpae Fructus* samples were measured. The iridoid glycoside content of the axial placentae of the fruits was high, whereas that of the seeds was low. After flowering, the fruits grew in length quickly until early July. The fruit weight and the iridoid glycoside content were in their maxima in August-September. Afterwards, the contents decreased. Most of the commercial crude drug (Kisasage) samples in Japanese market were from China and Hongkong, where this drug is called "Zizhi", and had low iridoid glycoside contents.

9205-2866 Rajasekharam, S., Jawahar, C.R., Radhakrishnan, K., Ratheeskumar, P.H., Sarada Amma, L., Pushpangadhan (All India Co-ordinated Research Project on Ethnobiology, CCRAS, Government of India, Thiruvananthapuram 695012, Kerala) **Healing art of Kani tribes of Kerala. I. Sudorification (medicated steam bath).** *Aryavaidyan*, v. 5(3): p. 149-155, 1992 (2 ref, Eng).

Sudorification is a term used for medicated steam bath of the Kani tribes of Kerala. Nearly 68 raw plant products

are used for the purpose specially for various dermatological conditions including psoriasis. Also, ingredients of decoction prescribed for oral administration during the steam-bath process have been tabulated. NSL, New Delhi.

9205-2867 Rajasekharan, S., Jawahar, C.R., Radhakrishnan, K., Ratheeskumar, P.K., Sarada Amma, L., Pushpangadhan, P. (All India Co-ordinated Research Project on Ethnobiology, RRL, CCRAS, Thiruvananthapuram 695012, Kerala, India) **Healing art of Kani tribe of Kerala. II. An absorbent technique for snake bite using "Vishakallu" (A kind of medicated stone charged with anti-poisonous properties).** *Aryavaidyan*, v. 5(4): p. 224-226, 1992 (6 ref, Eng).

"Vishakallu" a kind of medicated stone and ascribed anti-poisonous properties to it. The ingredients for "Vishakallu" stone are the following, leaves of *Ocimum sanctum*, *Anisomeles malabarica*, *Leucas aspera*, *Piper betle*, *Santalum album* and some pebbles from the river shore. Application of the stone is done by directly placing the stone on the bitten part, which will stick automatically and absorb the poison from the body. When the absorption is completed the stone detaches from the body. NSL, New Delhi.

9205-2868 Sarma, B.P., Ojha, D. (Department of Kayachikitsa, Institute of Medical Sciences, BHU Varanasi 5, UP, India) **The management of *Gandupada Krimi* (*Ascaris lumbricoides*) with indigenous drugs.** *Aryavaidyan*, v. 5(3): p. 170-172, 1992 (Eng).

Indigenous preparation from plants, *Erythrina indica*, *Embllica ribes*, *Butea monosperma*, *Ailanthus excelsa*, *Orxylum indicum* and *Mallotus philipensis* when administered in equal quantities were shown to be quite effective in the treatment of worm infestation. NSL, New Delhi.

9205-2869 Saxena, R.B., Daswni, M.T., Trivedi, P.D. (Drug Standardisation Research Project, CCRA &S, Dhavantri, Mandir, Jamnagar 361008, Gujarat, India) **Study of *Kubja Prasavini taila*.** *Aryavaidyan*, v. 5(4): p. 232-237, 1992 (16 ref, Eng).

Kubja prasarini taila is used for curing many ailments like vataroga, *kubjata stimitata*, etc. The ingredients used are, from plants products viz., *Paederia foetida*, *Sesamum indicum*, *Plumbago zeylanica*, *Piper longum*, *Madhuca indica*, *Sida cordifolia*, *Anethum sowa*, *Cedrus deodara*, *Pluchea lanceolata*, *Nardostachys jatamansi*, *Semicarpus anacardium*. Physico-chemical characteristics of the oil such as acid number, percent free fatty acids, degree of acidity, molecular weight, apparent density and refractive index are tabulated. NSL, New Delhi.

9205-2870 Xiong, Q.B., Shi, D.W. (Department of Pharmacognosy, School of Pharmacy, Shanghai Medical University, Shanghai 200 032, China) **Morphological and histological studies of Chinese traditional drug "Hua Jiao" (Pericarpium zanthoxyli) and its allied drugs.** *Acta Pharmaceutica Sinica*, v. 26(12): p. 938-947, 1991 (13 ref, Chi, Eng).

The Chinese traditional drug "Hua Jiao" specified in the Chinese Pharmacopoeia 1990 edition is the dried pericarp of ripe fruit of *Zanthoxylum schinifolium* or *Z. bungeanum*. It has been used for epigastric pain accompanied by cold sensation, vomiting, diarrhoea and abdominal pain due to intestinal parasitosis, ascariasis and used externally for eczema. By the investigation of the drug resources in the main producing areas and distributing regions (Sichuan, Guangxi, Henan, Liaoning, Zhejiang, Anhui, Jiangsu and Shandong Provinces or Autonomous Regions), it was found that the pericarps derived from more than 18 spp. of *Zanthoxylum* are used as drugs in China. The morphological and histological characters of crude drugs derived from *Zanthoxylum bungeanum*, *Z. schinifolium*, *Z. armatum*, *Z. simulans*, *Z. avicennae*, *Z. ailanthoides*, *Z. molle* and *Z. nitidum* have been described with illustrations. The external characters of pericarp, the occurrence of hairs on fruit stalk, the presence and location of pigment and crystals of hesperidin, the thickness of the cell walls of endocarp and the presence and shape of nonglandular hairs on fruit stalk were found to be important for the identification of these drugs.

9205-2871 Yoneda, K., Longjin, H., Kawaoka, K., Yamagata, E. (Faculty of Pharmaceutical Sciences, Osaka University, 1-6 Yamada-oka, Suita, Osaka 565, Japan) **Studies on resources of crude drugs (VII). beta-amylase activities on the heating process of Coptis Rhizome.** *Shoyakugaku Zasshi*, v. 46(1): p. 71-75, 1992 (5 ref, Eng, Jap).

The saccharifying activity of amylase in the Coptis Rhizomes obtained from Japan, China, Thailand, Burma and India was measured. The difference in the activity among Japanese samples was quite considerable and most of the samples from Echizen (Fukui pref.) had very low activity. Chinese samples, Yunlian and Yelian, had a low activity, but other Chinese and south Asian samples had little or no activity. The saccharifying activity of amylase of the fresh rhizome of *C. japonica* var. *dissecta* decreased to 1/2 when heated at 80 degree C for 12 h, whereas in the case of the rhizomes which had been dried at room temperature, the decrease in the activity was less.

Clinical Studies

9205-2872 Baxi, Sinha, K.R.P., Sinha, M.K., Narsaria, U. (Ranchi Mansik Arogyashala, Kanke, Ranchi, Bihar, India) **A pilot study on Mentat.** *Probe*, v. 31(3): p. 240-243, 1992 (Eng).

Twenty three children with various problems such as hyperkinesia (4), nocturnal enuresis (6), selective mutism (5), decline in scholastic performance (3) and mental retardation (5), were included for a trial with Mentat given over 4-6 months. Good improvement and control were seen in all the disorders except mental retardation, although encouraging results in IQ levels have been noticed.

9205-2873 Bhandari, N.R., Singh, M. (Department of Paediatrics, Gandhi Medical College, Bhopal, MP, India) **A clinical observation with a herbal cough syrup.** *Antiseptic*, v. 89(6): p. 293-295, 1992 (19 ref, Eng).

300- Paediatric patients were treated with herbal cough syrup. Patients with upper respiratory tract infection (URI) and acute respiratory infection (ARI) were treated with the herbal cough syrup alone or with necessary antibiotic when needed. Response in case of URI, when treated with the cough syrup alone was found to be satisfactory in more than 80 percent cases in 3 days therapy while ARI 22.7 percent cases got relief in 5 days and 40.9 percent more cases in 7 days. Response in URI when treated with the cough syrup in combination with necessary antibiotic, were observed in 50 percent cases, in 2 days and an additional 22.7 percent cases in 5 days, while ARI more than 82 percent cases got relief in 5 days. Seven patients of asthmatic bronchitis treated with syrup also showed good response. No side effects was observed. NSL, New Delhi.

9205-2874 Cao, L.X., Yu, J., Xia, X.Q. (Obstetric and Gynecological Hospital, Shanghai Medical University, Shanghai 200011, People's Republic of China) **Effect of Shen-Qian Gu-Jing granule on fibrin degradation products in serum and menstrual fluid of patients with menorrhagia.** *Chinese Journal of Integrated Traditional and Western Medicine*, v. 11(7): p. 409-410, 1991 (2 ref, Chi, Eng).

Shen-Qian Gu-Jing granule was used in the treatment of the menorrhagia in 72 cases including idiopathic menorrhagia 28, uterine myoma 29, endometriosis 7, intrauterine device 5, postpartum and post induced abortion 3 cases. The amount of menstrual loss (MBL) and the fibrin degradation products (FDP) level in menstrual fluid and peripheral blood were measured before and after treatment. 87.5 percent of all cases showed a significant decrease in MBL (P less than 0.05). The local FDP level significantly decreased parallel to effectiveness of MBL. The results suggest that the func-

tion of this Chinese herbs complex in menorrhagia was related to the regulation of FDP level.

9205-2875 Cerna, H., Fiala, B., Han, K., Jansa, P., Pastnak, A., Simanek, V., Lenfeld, J., Kroutil, M., Marsalek, E., Pokorny, J., Hejtmanek, J. (Department of Therapeutic Stomatology, Medical Faculty of Palacky University, Palackeho 12, 77200 Olomouc, Czechoslovakia) **Antiphlogistics in periodontology.** *Acta Universitatis Palackianae Olomucensis (Olomouc), Facultatis Medicae*, v. 123: p. 293-302, 1989 (7 ref, Eng, Cze).

Sanchelin gel (the mixture of sanguinarine and chelerythrine *Chelidonium majus* alkaloids, in 0.05 percent concentration) has been investigated in 146 individuals with inflammatory periodontal disease. The drug has been found to be effective in the treatment of inflammatory periodontal disease. The drug was more effective when applied into pockets.

9205-2876 Cheng, C. (Beijing Post and Telecommunication Hospital, Beijing 100032, China) **Clinical observation and experimental research on chronic bronchitis treated with Ke Chuan Ping decoction.** *Chinese Journal of Integrated Traditional and Western Medicine*, v. 11(4): p. 203-205, 1991 (7 ref, Chi, Eng).

This paper presents the results of clinical observation and experimental research of Ke Chuan Ping (KCP) in treating 31 cases of chronic bronchitis compared with that of traditional prescription Qing Jin Hua Tan decoction (QJHT) in other 31 patients with the same conditions randomized as control. According to laboratory observation KCP had the ability to dilute sputum-viscosity, promote pulmonary ventilation function, decrease WBC and raise PO₂. Animal experimental research suggested that KCP had the effects on reducing sputum, relieving cough, modifying stridor and inhibiting bacteria. It was proved that KCP is a highly effective recipe for patients with chronic bronchitis. It was also shown that clearing away heat and dispersing phlegm-therapy is an important measure for chronic bronchitis with Biao Zheng.

9205-2877 Cui, J., Chen, K.J. (Xiyuan Hospital, China Academy of Traditional Chinese Medicine, Beijing 100091, People's Republic of China) **Clinical research of American ginseng compound liquor on retarding-aging process.** *Chinese Journal of Integrated Traditional and Western Medicine*, v. 11(8): p. 457-460, 1991 (2 ref, Eng).

Thirty six cases were administered with American ginseng compound liquor as a treated group, 35 cases were administered with American ginseng liquor only as a control group. The total effective rates of the treated group and the control group on symptoms associated with aging were

88.89 percent and 68.57 percent respectively (P less than 0.05). The results indicated that symptoms of Kidney-Yang deficiency in the treated group were improved much better than those of the control group (P less than 0.05). Obviously, SOD activity of erythrocyte and SOD/LPO ratio increased remarkably and serum content of LPO decreased significantly in both groups (P less than 0.001). In the treated group, the function months of age (physiological age) decreased from 751.77±5.215 to 743.53±5.144, the effective rate was 68.57 percent. It showed that these two recipes had the efficiency on prolonging the functional age (P greater than 0.05).

9205-2878 Deshmukh, A.A., Vadlamudi, V.P., Wagh, K.R. (Marathwada Agricultural University, Parbhani, Maharashtra, India) **Hypoglycaemic activity of *Bougainvillea spectabilis*.** *Probe*, v. 31(3): p. 254-256, 1992 (9 ref, Eng).

Oral administration of the leaf juice of *B. spectabilis* (1 ml of juice=1 gm of leaves), at the rate of 1 gm/kg/day for 14 or more consecutive days significantly lowered the hyperglycaemic response in alloxan-induced diabetes in rabbits.

9205-2879 Fang, L.Y., Lin, S.S. (Fuzhou No1, Hospital, Fuzhou Institute of Medical Science, Fuzhou 350 009, People's Republic of China) **Clinical observation and experimental study on Shenghong Kangyan Su in treating 144 cases of pelvic inflammation with blood stasis syndrome.** *Chinese Journal of Integrated Traditional and Western Medicine*, v. 11(7): p. 411-412, 1991 (4 ref, Chi, Eng).

One hundred and forty four cases of pelvic inflammation with blood stasis syndrome (BSS) were treated with Shenghong Kangyan Su. The total effective rate was up to 97-92 percent, cure rate up to 78.75 percent, without toxicity and side effects.

9205-2880 Feng, J. (Jiangsu Provincial Hospital of TCM, Nanjing 210 005, China) **Clinical and theoretical study of effect of Fu-Zheng Qu-Xie on gastric disease infected with *Campylobacter pyloridis*.** *Chinese Journal of Integrated Traditional and Western Medicine*, v. 11(3): p. 150-152, 1991 (14 ref, Chi, Eng).

Chinese herbal medicine and gentamycin were used separately in the treatment of 75 cases of gastric disease by *Campylobacter pyloridis* (CP). In the Chinese herbal medicine group clinical symptoms were obviously improving, the effective rate for CP being 80 percent (24/30), the death rate for CP 30 percent (9/30), and the effective rate for patho-histological changes 50 percent (15/30). This text pointed out that the principle of Chinese herbal medicine

treatment of gastric disease by *Campylobacter pyloridis* was Fu-Zheng Qu-Xie. Fu-Zheng was achieved by *Astragalus membranaceus*, *Atractylodes macrocephala* and *Paeonia lactiflora*, whereas Qu-Xie by *Taraxacum mongolicum* and *Oldenlandia diffusa*. Chinese herbal medicine for Fu-Zheng played an important role in modulating immune function. Qu-Xie was directly disinfective and indirectly anti-bacterial. Chinese herbal medicine combined with western drugs will decrease the side-effects and enhance the curative effect at the same time.

9205-2881 Gao, Z., Fan, Z., Yun, y. (Henan College of TCM, Zhengzhou 450 000, China) **Clinical and experimental research on prevention and treatment of child reversal respiratory tract infection by Feibao.** *Chinese Journal of Integrated Traditional and Western Medicine*, v. 11(4): p. 206-208, 1991 (4 ref, Chi, Eng).

Feibao syrup consisted of Radix Astragali, Herba Hedyotis diffusae, etc. The clinical research proved that after taking the medicine, the general condition, appetite and anemia were improved, the profuse sweating disappeared, the tolerance against cold was improved, the frequency of occurrence of the disease was decreased or ceased. Even if the disease occurred, the symptoms were mild, the disease course was short. The efficacy of the medicine was 95.2 percent. It was better than that of leavmisolet (78.6 percent), P. This medicine can obviously improve that level of serum IgA and the cellular immunity (P).

9205-2882 Huang, H.F., Wang, M. (Department of Obstetrics and Gynecology, Zhejiang Medical University, Hangzhou 310006, China) **Effects of gossypol and GnRHa on the prostaglandins contents of endometriotic cell and in situ.** *Chinese Journal of Integrated Traditional and Western Medicine*, v. 11(9): p. 527-529, 1991 (10 ref, Chi, Eng).

In order to study a direct effect of some traditional and western medicine on the prostaglandins (PGs) of endometriosis, endometriotic cell and endometrial cell in situ were cultured in vitro, 6-keto-PGF α 1 and thromboxane (TXB $_2$) were measured in the above cells using the RIA from the superfusates. These PGs changes after gossypol acetate, progesterone, danazol and gonadotrophin releasing hormone agonist (GnRHa) treatment were studied. High PGs levels were observed in endometriotic cell, and higher in endometrial cell in situ of patients than in endometrial cell of healthy persons (P less than 0.01). After treatment with drug (but not GnRHa), the prostacyclin (PGI $_2$) and TXB $_2$ content were reduced in endometriotic cell. Gossypol acetate, progesterone and danazol inhibit PGI $_2$ and TXB content in endometrial cell of patients with endometriosis.

9205-2883 Jagdeesh, S., Gopumadhavan, S., Chauhan, B.L., Kulkarni, R.D. (R&D Centre, The Himalaya Drug Co., Bangalore, Karnataka, India) **Absence of teratogenicity in Mentat.** *Probe*, v. 31(4): p. 337-341, 1992 (4 ref, Eng).

Ten pregnant rats were divided into two groups of five each. Group I served control and group II animals received Mentat 2 gm/kg in the form of water suspension once a day orally for 20 days. No adverse effects on pregnancy and growth of foetus in utero were encountered in group II rats. Further, no differences were observed in either haematological or biochemical parameters in the Mentat treated rats, which indicate that Mentat has no ill-effects during embryogenesis.

9205-2884 Jin, Y., Tang, T. (Wuhan Fourth Municipal Hospital, Wuhan 430 033, China) **Clinical study on Paeonia lactiflora injection in treating chronic cor pulmonal with Pulmonary hypertension.** *Chinese Journal of Integrated Traditional and Western Medicine*, v. 11(4): p. 199-202, 1991 (7 ref, Chi, Eng).

10 patients with CCP (Chronic or pulmonal) as well as pulmonary hypertension, were considered as invasive methods group (IMG) and were treated by injecting 100 percent *P. lactiflora* 5 ml (one time). After the treatment, the clinical features of blood stasis were improved significantly in NMG (non invasive methods) (P). Also the results of impedance cardiogram and pneumogram (such as: Q-B, B-Y interval and Q-B/B-Y ratio, cardiac output), the hemorheologic parameters (such as: blood viscosity, plasma viscosity, hematocrit and erythrocyte electrophoresis) and oxygen consumption of myocardium were improved significantly in NMG and IMG. In IMG, PAP was reduced by 0.71 \pm 0.27 kgPa; PaO $_2$ was promoted significantly in NMG, (P or 0.01). There are no statistical significance about the change of PaCO $_2$, SaO $_2$, blood pH and Bp (P).

9205-2885 Katharia, S.K., Singh, S.P., Kulshreshtha, V.K. (Department of Dental Surgery and Pharmacology and Therapeutics, KGM, Lucknow, UP, India) **A clinical assessment of ibuprofen and a new herbal compound in oral surgical procedures.** *Indian Journal of Pharmacology*, v. 24(1): 29-31, 1992 (10 ref, Eng).

A randomised clinical trial was done to assess the efficacy of Herborheumal, a new herbal compound, in post operative surgical patients. It is an antiinflammatory and analgesic compound, and consists of *Withania somnifera*, *Boerhaavia diffusa*, *Tribulus terrestris* and *Aconitum ferox*. The result showed that the herbal compound has been demonstrated as a better antiinflammatory and analgesic in comparison with placebo and Ibuprofen. NSL, New Delhi.

9205-2886 Khare, A. (Department of Medicine, Institute of Medical Sciences, Banaras Hindu University, Varanasi, UP, India) **Hepatoprotective role of Liv.52 against hepatitis induced by antitubercular drugs.** *Probe*, v. 31(3): p. 260-261, 1992 (Eng).

Seventy patients, in the age group of 12-60 years receiving antitubercular drugs were given Liv.52 (every alternate patient) to judge its effectiveness to prevent hepatic damage. In the Liv.52 group only 1 out of 35 developed jaundice as against 5 out of 35 in the non-Liv.52 group. Liv.52 appears to have protected the liver against drug toxicity and the patients regained appetite and weight within 6-8 weeks of therapy.

9205-2887 Korwin-Piotrowska, T., Nocon, D., Stankowska-Chomicz, A., Starkiewicz, A., Wojcicki, J., Samochowiec, L. (Clinic of Neurology, Institute of Pharmacology and Toxicology, Medical Academy, Powstancow Wielkopolskich 72, 70-111 Szczecin, Poland) **Experience of Padma 28 in multiple sclerosis.** *Phytotherapy Research*, v. 6(3): p. 133-136, 1992 (18 ref, Eng).

One hundred subjects suffering from a chronic progressive form of multiple sclerosis were randomly divided into two equal groups. Group 1 received a herbal mixture, Padma 28, two tablets three times a day, and group 2, the control, were treated only symptomatically. Treatment and observation lasted for 1 year. A positive effect of Padma 28 was observed in 44 percent of patients with multiple sclerosis in the form of improvement of general condition, increase of muscle strength, decrease or disappearance of disorders affecting sphincters. In 41 percent of patients with initially an abnormal tracing of visual evoked potentials, an improvement or normalization was achieved. Of patients, who did not receive Padma 28 none felt better, moreover, 40 percent of them showed a deterioration. Tolerance of the drug was excellent.

9205-2888 Koti, S.T. (Rural Medical Research Centre and Hospital, Virar, Maharashtra, India) **Evaluation of septilin in persistent low grade infections in school children: A placebo-controlled study.** *Probe*, v. 31(4): p. 325-328, 1992 (Eng).

In a placebo-controlled trial of 42 school students aged between 5 and 11 years, with persistent upper respiratory tract and ENT infections it was seen that septilin administration brought about excellent results both clinically and symptomatically. Overall improvement was observed and there were no recurrences.

9205-2889 Li, L.S., Liu, Z.H. (Jinling Hospital, Nanjing 210002, People's Republic of China) **Clinical and experimental studies of Rheum on preventing progression**

of chronic renal failure. *Chinese Journal of Integrated Traditional and Western Medicine*, v. 11(7): p. 392-396, 1991 (10 ref, Chi, Eng).

A clinical prospective trial was conducted with *Rheum* to evaluate its effect in comparison with the Captopril. 30 Cases with initial Scr level of 344(+/-)114.0 micro mol/l were allocated randomly to 3 groups. The long term (6-22 months) follow-up results showed that the progression rate of renal failure, calculated by regression analysis of 1/Scr vs time, was found to be retarded after treatment, being more marked in both *RheumE* and *RheumE+Captopril* group. Uremic symptoms improved after the treatment with serum albumin level increased. *Rheum* has been found to suppress the proliferation of glomerular mesangial cells in culture. In 5/6 nephrectomized rats, the oxygen consumption of remnant kidney was obviously decreased by feeding the animal *RheumE* and the hypermetabolic state was ameliorated as well. The level of azotemia was lessened remarkably. The serum albumin and transferrin contents of the animals were increased whereas blood cholesterol and triglycerides decreased.

9205-2890 Li, Y. (Henan College of TCM, Zhengzhou 450003, China) **Clinical and experimental study on the treatment of children diarrhea by granule of children-diarrhea fast-stopping.** *Chinese Journal of Integrated Traditional and Western Medicine*, v. 11(2): p. 79-82, 1991 (7 ref, Chi, Eng).

Granule of children-diarrhea fast-stopping is a proved recipe composed of seven medical herbs such as *Poria cocos*, haw charcoal, and *Euphorbia humifusa*. The total effective rate proved to be 96.4 percent and the cure rate 90 percent, much better than the control groups (TCM: Gelian San) and Shenglingbaizhu San, WM: gentamycin and PPA). It had the effect of fast stopping diarrhea and shortening the recovery period. It also had excellent curative effect for acute and chronic diarrhea, for noninfective and infective diarrhea with virus or germs.

9205-2891 Li, J.L., Jin, Y. (The Institute of Integrated Traditional Chinese and Western Medicine, Hunan Medical University, Changsha 410008, China) **Clinical studies on the treatment of peptic ulcer with Jian-Wei Yu-Yang tablets.** *Chinese Journal of Integrated Traditional and Western Medicine*, v. 11(3): p. 141-143, 1991 (6 ref, Chi, Eng).

Second stage clinical trial on the treatment of peptic ulcer with Jian-Wei Yu-Yang (JWYY) tablets in comparison with a control group treated with ranitidine has been reported. The results showed that the cure rate for JWYY tablet group was 62.4 percent and its effective rate was 93.8 percent in 354 cases, whereas the cure rate of the control

group was 50.7 percent and its effective rate was 86.4 percent case. After one year follow up studies of the therapeutic effect, the recurrence rate of the JWYY tablet group was 17.7 percent, while that of the ranitidine group was 54.1 percent. In addition, JWYY tablet had no side-effects. These data indicated that JWYY tablets were a more effective therapeutic remedy for peptic ulcer..

9205-2892 Liang, X., Gno, S.(PUMC Hospital, Chinese Academy of Medical Sciences, Beijing 100730, China) **Effect of Jiang-Zhi-Zhong-Yao-Pian on TC, TG, TXB2, 6-keto-PGF, alpha in hyperlipemic patients.** *Chinese Journal of Integrated Traditional and Western Medicine*, v. 11(1): p. 20-22, 1991 (9 ref, Chi, Eng).

Efficacy of the Chinese herbal medicine Jiang-Zhi-Zhong-Yao-Pian to reduce serum lipids has been tested. Drugs were administered for nearly 3 months. Result showed that the serum levels of total cholesterol, triglyceride, TXB2 has been significantly reduced. In the case of groups administered primose oil capsules TC, TG and TXB2 was slightly reduced. The medicine showed no side effects. The results showed that the herbal formula is useful for the treatment of hyperlipemic patients..

9205-2893 Liangmin, L.D.(Department of TCM, Union Hospital, Fujian Medical College, Fuzhou 350001, People's Republic of China) **Treatment of deficiency of spleen energy with Zhenqui Fuzheng Chongji and its effect on Zn, Cu and Mg in serum.** *Chinese Journal of Integrated Traditional and Western Medicine*, v. 11(8): p. 471-472, 1991 (7 ref, Chi, Eng).

There is a good response, with an effective rate of 96.2 percent in the treatment of the deficiency of Spleen energy (DSE) with Zhenqi Fuzheng Chongji (ZQFZCJ). The serous level of ZQFZCJ and the serous concentrations of Zn, Cu and Mg in 53 patients with DSE and in 83 normal subjects were measured with atomic absorption spectrometric analysis. In contrast to the normal subjects, the concentrations of Zn and Mg were decreased and that of Cu and the ratio of Cu/Zn inncreased in the patients before treatment (P greater than 0.01 to 0.05). After treatment, however, the concentrations of Zn and Mg became increased (P less than 0.001, P less than 0.05), and the ratio of Cu/Zn decreased (P greater than 0.001). It is concluded that there is some relationship between these three elements and DSE, and the mechanism for the treatment of DSE with ZQFZCJ. ZQFZCJ, rich in trace elements, may provide trace elements for the body, improve the metabolism, transportation and utilization of the trace elements in the body, and activate various enzymes, thus regulating and maintaining the homeostasis, i.e. "supporting in deficient patient".

9205-2894 Liu, J.B., Liu, J., Jin, S.L. et al(Department of Infections Diseases, Xijing Hospital, Xian 710 032, People's Republic of China) **TCM-WM treatment of severe renal failure in patients with epidemic hemorrhagic fever.** *Chinese Journal of Integrated Traditional and Western Medicine*, v. 11(8): p. 475-476, 1991 (8 ref, Chi, Eng).

Treatment of 23 cases (with the control group 20 cases) of severe renal failure in patients with epidemic hemorrhagic fever (EHF) by integrated traditional Chinese medicine and western medicine has been reported. The effects were as follows: (1) The curative rate was elevated and the morbidity was dropped (P ~0.05). (2)Both the period of oliguria and albuminuria were shortened (P~0.05). (3)The severity of the complication, e.g., massive gastro-intestinal hemorrhage, etc., was much reduced (P). (4)The degree of azotemia was getting milder. And the renal function was much improved (P). The mode of action of the renal protective decoction is based on the point of view of the TCM in the treatment of infectious disease.

9205-2895 Lu, Q.B., Xia, G.C., Chen, D.H.(Jiangsu Hospital of TCM, Nanjing 210029, China) **Clinical observations on the treatment of climacteric syndrome with new Gengnian prescriptions.** *Chinese Journal of Integrated Traditional and Western Medicine*, v. 11(9): p. 535-537, 1991 (3 ref, Chi, Eng).

It was found by the observations of clinical treatment that the three indexes of epinephrine, norepinephrine and dopamine of urinary catecholamine increased for the climacteric patients who suffered from the deficiency of Yin leading to the hyperactivity of the internal heat of the heart, and the urinary 17-hydroxycorticoid for the patients who suffered from the deficiency of Yin leading to the hyperactivity of the internal heat of the liver. After the treatment with new Gengnian prescriptions, the clinical symptoms of the patients were improved.

9205-2896 Marena, C., Lampertico, M.(Medical Department, Inverni Della Beffa SpA. Via Ripamonti 99, Milan, Italy) **Preliminary clinical development of Silipide: A new complex of silybin in toxic liver disorders.** *Planta Medica*, v. 57(Supplement 2): p. A124-A125, 1991 (3 ref, Eng).

Silybin is one of the main active substances in the extract of *Silybum marianum* seeds, and was recently prepared as a phosphatidylcholine complex (Silipide, 1DB 1016) to provide greater and reproducible bioavailability after oral administration. In patients with alcoholic hepatitis, the AST and ALT levels returned to normal faster with 1DB 1016. Similarly, in acute viral hepatitis, despite the rapid course of the illness, life-table analysis demonstrated that

patients given 1DB 1016 experienced a significantly greater chance of normalization of ALT ($p=0.026$) and AST ($p=0.039$) compared to placebo-treated subjects. In iatrogenic hepatitis, the treatment with 1DB 1016 prevented the alteration in liver enzymes, whereas a progressive increase in ALT and AST activities was seen in placebo-treated subjects.

9205-2897 Navratil, J., Sklenovsky, a., Petr, J. (Department of Pathological Physiology, Medical Faculty of Palacky University, S. Allende 3, 775 15 Olomouc, Czechoslovakia) **Possibilities of clinical application of physostigmine.** *Acta Universitatis Palackianae Olomucensis (Olomouc), Facultatis Medicae*, v. 122: p. 159-162, 1989 (12 ref, Eng).

Possibilities of clinical application of physostigmine as analgesic as well as in various CNS disorders has been reviewed.

9205-2898 Nikaido, T., Iizuka, S., Okada, N., Kuge, T., Ohmoto, T. (Toho University, School of Pharmaceutical Sciences, Funabashi, Chiba 274, Japan) **The study of Chinese herbal medicinal prescription with enzyme inhibitory activity. VI. The study of Makyo-kanseki-to with adenosine 3',5'-cyclic monophosphate phosphodiesterase.** *Yakugaku Zasshi*, v. 112(2): p. 124-128, 1992 (6 ref, Jap, Eng).

A Chinese herbal medicinal prescription, Makyo-kanseki-to, was studied for the inhibitory activity of adenosine 3',5'-cyclic monophosphate (cAMP) phosphodiesterase. The effect for the inhibitory activity of cAMP phosphodiesterase by combination with constituent crude drugs of the prescription was studied. Gypsum acted as a mitigatory component for *Ephedra* herb and *Glycyrrhiza* in cAMP phosphodiesterase inhibition test.

9205-2899 Okubo, T., Ishihara, N., Oura, A., Serit, M., Kim, M., Yamamoto, T., Mitsuoka, T. (Central Research Laboratories, Taiyo Kagaku Co. Ltd., Yokkaichi 510, Japan) **In vivo effects of tea polyphenol intake on human intestinal microflora and metabolism.** *Bioscience, Biotechnology and Biochemistry*, v. 56(4): p. 588-596, 1992 (22 ref, Eng).

Effects of tea polyphenol intake (0.4 g/volunteer, T.D.S/4 weeks) on fecal microflora, bacterial metabolites and pH were investigated using 8 healthy human volunteers. Counts for *Clostridium* species were significantly decreased during the tea polyphenol intake period. Percentage of *Bifidobacterium* spp. (acid forming bacteria) and the content of volatile fatty acids including acetic and propionic acid decreased. However, tea polyphenols had no effect on fecal enzyme activities, ammonia or petrefied products 2

Weeks after discontinuing the biological parameters returned to normal.

9205-2900 Palkar, M.G. (Ratnagiri Cancer Society, District Government Hospital, Ratnagiri, Maharashtra, India) **Role of geriforte as an adjuvant therapy in cancer patients.** *Probe*, v. 31(3): p. 226-229, 1992 (5 ref, Eng).

Geriforte was tried along with vitamins and an iron supplement on 20 patients (Group A) undergoing chemotherapy for cancer and the results were compared with another 20 control patients (Group B) receiving chemotherapy and only vitamins and an iron supplement. Marked improvement was observed in Group A (Geriforte) patients as regards nausea, vomiting and weight loss, compared to Group B (control) patients. The most remarkable difference was observed in a sense of well-being and absence of depression with Geriforte.

9205-2901 Patel, V.K., Patel, R.V., Venkatakrishna-Bhatt, H., Gopalakrishna, G., Devasankariah, G. (Department of Pharmacology and Therapeutics, Government Dental College and Hospitals, Asarva, Civil Hospital Compound, Ahmedabad 380 016, Gujarat, India) **A clinical appraisal of Anacyclus pyrethrum root extract in dental patients.** *Phytotherapy Research*, v. 6(3): p. 158-159, 1992 (7 ref, Eng).

Two hundred dental patients were subjected to a double blind study following oral surgery for comparing the activity of an alcoholic extract of the roots of *A.pyrethrum* (2 percent alcohol extract, freshly dissolved in sterile distilled water) with xylocaine. The strength of anaesthesia, its effect on surgery, post-operative recovery and wound healing were studied. The plant extract was found useful and safe at lower concentrations (less than 2 percent), not showing any side effects and facilitated anaesthesia for prolonged oral reconstructive surgery when compared with xylocaine.

9205-2902 Paul, A.K., Madan, S., Gupta, V. (Eye Hospital, Sitapur 261001, UP, India) **Clinical evaluation of an indigenous herbal eye drops preparations (Part I).** *Indian Journal of Clinical Practice*, v. 11(2): p. 58-60, 1992 (7 ref, Eng).

A controlled study was made with a herbal eye drops preparations in different types of corneal ulcer cases. Composition of the eye drop consists of aqueous extracts of *Azadirachta indica*, *Moringa pterygosperma*, *Eclipta alba*, *Boerhaavia diffusa*, *Vitex negundo*, *Rosa damascena*, *Carum copticum*, *Terminalia chebula*, *T.belerica*, *Emblica officinalis*, *Curcuma longa*, *Camphora officinarum*, *Mentha sylvestrica*, *Santalum rubrum*, *S.album*, *Heliotropium indicum*, *Ocimum sanctum*, *Elettaria cardamomum* along with other ingredients. Patients who received the conven-

tional mydriatics, antibiotics etc. along with herbal preparations recovered sooner than those receiving the same conventional therapy alone. The efficacy of the drug was most pronounced in viral keratitis. It was found to be free from any side effect NSL, New Delhi.

9205-2903 Qi, X. (Third Hospital Affiliated to China Medical University, Shenyang, 110 003, China) **Study on protective mechanism of *Salvia miltiorrhiza* and *Paeonia lactiflora* for experimental liver damage.** *Chinese Journal of Integrated Traditional and Western Medicine*, v. 11(2): p. 102-104, 1991 (10 ref, Chi, Eng).

Experimental model of acute liver damage with D-galactosamine was made, *S.miltiorrhiza*(SM) and *P.lactiflora*(PL) were given to the rats. Survival rate of rats and liver coefficient (liver weight/body weight) were observed. The results showed that SM and PL could increase plasma fibronectin levels in rats, and improve the reticuloendothelial system function and plasma opsonic activity. Aggregation of microaggregated albumin, collagen fragment and immune complexes were markedly reduced. Liver immune damage and microcirculation disorder were avoided. Meanwhile, PPN could cause increase of phagocytosis of Kupffer cell to endotoxin. It is concluded that SM and PL play an important role in protective hepatocyte.

9205-2904 Qian, Z.Q., Liu, C.F., Chen, Y.X. (Shanghai Nanshi District Maternity and Infant Health Institute, Shanghai 200010, China) **Prediction and prevention of hypertension syndrome of pregnancy.** *Chinese Journal of Integrated Traditional and Western Medicine*, v. 11(9): p. 530-532, 1991 (7 ref, Chi, Eng).

Analysis of mean artery pressure (MAP-2) according to the differentiation of symptom complex of TCM can predict the occurrence of hypertension syndrome of pregnancy (HSP) at patients' first visit to hospital during their middle gestational period (less than 24 pregnant weeks). (MAP-2 greater than 12kPa) were divided into 4 groups and given preventive treatment as follows: group, 122 women, no drugs were given; (2) the Theragan group, 102 women; (3) the TCM (A) group, 100 women, those with Liver-Kidney deficiency of Yin or no apparent signs were given Qiju Dihuang Wan, and those with Spleen-Kidney, deficiency of Yang were given Shenqiwan; (4) the TCM (B) group, 100 women, were given *Salvia miltiorrhiza* plus (A) group's drugs. The occurrence rates of HSP in 4 groups were 49.2, 30.4, 15 and 14 percent respectively. There was no side effect for mother and infant after preventive treatment. No eclampsia occurred.

9205-2905 Ramfi, Sarma, B.P., Tripathi, S.N. (Department of Kayachikitsa, Institute of Medical Sciences, BHU,

Varanasi 5, UP, India) **Effect of Kalmegha and amlaki compounds on viral hepatitis (Koshtha-Shakhashrita Kamala).** *Aryavaidyan*, v. 5(3): p. 164-169, 1992 (Eng).

Whole plant of Kalmegha and fruits (without seed) of amalaki was powdered and 500 mg tablets were prepared. The patients were given 4 tablets thrice daily for 30 days. Wherever, treatments were given extended periods of upto 2-3 months. Results shows that *Andrographis paniculata* (Kalmegha) and Amalaki (*Phyllanthus emblica*) compound is effective in viral hepatitis and can be used safely. NSL, New Delhi.

9205-2906 Rauwald, H.W., Grunwidl, J. (Institut für Pharmazeutische Biologie, Johann Wolfgang Goethe-Universität, Georg-Voigt-Str. 16, D-6000 Frankfurt/M. 11 Federal Republic of Germany) **Ruscus aculeatus extract: Unambiguous proof of the absorption of spirostanol glycosides in human plasma after oral administration.** *Planta Medica*, v. 57(Supplement 2): p. A75-A76, 1991 (4 ref, Eng).

One gram of *Ruscus* extract was orally administered to three healthy human volunteers. Blood samples were taken just before the administration and 30, 60, 90, 120, 150, 180 and 240 minutes after and plasma samples were frozen immediately. The saponins were separated from plasma component by the solid phase extraction. Pharmacokinetics of the spirostanol glycosides were studied by HPLC method developed.

9205-2907 Shi, Y., Wu, Q. (Institute of TCM-WM, Childrens Hospital, Shanghai Medical University, Shanghai, 200032, China) **Idiopathic thrombocytopenic purpura in children treated with replenishing Qi and tonifying kidney and the changes of thrombocyte aggregative functions.** *Chinese Journal of Integrated and Traditional Western Medicine*, v. 11(1): p. 14-16, 1991 (6 ref, Chi, Eng).

Qi, traditional Chinese medicine consists of basic plant products of *Radix rehmanniae*, *Angelicae sinensis*, *Paeoniae rubra*, *Radix rubiae*, *Fructus psoraleae*, *radix Astragali*, *Chinese jujubae*, and *radix et rhizoma rhei*. The treatment of the drug was carried out for 6 months in children suffering from ITP. The results showed remarkable improvement in both chronic and acute idiopathic thrombocytopenic purpura in children.

9205-2908 Song, C., Zao, S., Wang, D.J. (Jinan Railway Central Hospital, Jinan 250001, People's Republic of China) **Clinical and experimental research of the treatment of chronic renal failure with Shenshuaifang.** *Chinese Journal of Integrated Traditional and Western Medicine*, v. 11(8): p. 461-464, 1991 (5 ref, Chi, Eng).

Thirty three cases of chronic renal failure (CRF) patients were treated by coloclysis with Chinese medicine Shenshuaifang (SSF). The effective rate was 60.61 percent, the total effective rate was 87.88 percent. It showed significant difference in the total effective rate compared with the control group (P). Animal experiments showed SSF could slow down the rising of the blood Cr and BUN of the mice which suffered with CRF, and reduce their urine protein. SSF had good effect on lowering the blood Cr and BUN of the CRF patients, so it could delay the progress of CRF, and it's effect was better than the general medical conservative treatment.

9205-2909 Stock, S., Holzl, J. (Institut für Pharmazeutische Biologie, Philipps-Universität Marburg, D-3550 Marburg/Lahn, Federal Republic of Germany) **Pharmacokinetic test of {14C}-labelled hypericin and pseudohypericin from *Hypericum perforatum* and serum kinetics of hypericin in man.** *Planta Medica*, v. 57(Supplement 2): p. A61-A62, 1991 (2 ref, Eng).

The concentration of hypericin (H) in human serum was determined by application of a single dose of an aqueous-ethanolic extract from *Herba Hyperici* (*H. perforatum*) to a test person. The extract contained 1.0 mg of H in total. During a period of 8 hours blood samples of 5 ml were taken from the beginning up to 6h every 30 minutes, then every 60 minutes and were preserved. After centrifugation, the serum was separated, and the proteins were denatured with 2-propanol. The concentration of H was determined by isocratic RP 18 HPLC with a fluorescence detector. From 3.5 to 8.0 hours, the level of H raised from 0.45 ng/ml=0.20 percent to 4.21 ng/ml=1.90 percent with a slight decrease after 6h and a second significant rise until the end of the period. After 8h, a general decrease was not yet observed. The results found in human serum are comparable to those found in mice. In the latter the highest level of radioactivity was also observed after the maximum resorption time (6.0h).

9205-2910 Wang, D.Z., Wang, Z.Q., Zhang, Z.F. (Long Hua Hospital, Shanghai College of TCM, Shanghai 200032, China) **Study on the treatment of endometriosis with removing blood stasis and purgation method.** *Chinese Journal of Integrated Traditional and Western Medicine*, v. 11(9): p. 524-526, 1991 (5 ref, Chi, Eng).

According to the method of differentiation of symptom complexes of traditional Chinese medicine (TCM), endometriosis is a disease of blood stasis and mass in the lower portion of abdomen. 76 Cases were treated by TCM prescription named endometriotic pill No. 1 with rhubarb as the main ingredient. The chief functions of the rhubarb were removing blood stasis, disintegrating mass and purgation. The total effective rate was 80.26 percent.

Among them, the effective rate of dysmenorrhea was 88.89 percent, that of pelvic pain was 66.72 percent, that of intercourse pain 72.12 percent and diminishing in size of mass or nodule 22.15 percent; 3 cases of 22 infertility got pregnant (13.63 percent). The results revealed that the endometriotic pill No. 1 yielded distinct improvement in the treatment of endometriosis.

9205-2911 Wang, S., You, R. (Nanjing College of TCM, Nanjing, 210029, China) **Clinical and experimental study on treatment of anorexia in children with the activating spleen prescription.** *Chinese Journal of Integrated Traditional and Western Medicine*, v. 11(2): p. 75-78, 1991 (8 ref, Chi, Eng).

The results of the experimental study were as follows: Erbao instant granules (the medicine for activating the Spleen) had the effect of raising the D-xylose excretion rate of urine; increasing the ratio of T-lymph cells in blood; raising the quality of 8 mineral elements in hair and the quality of SIgA in saliva; adjusting the abnormal peristalsis of the experimental rabbits and promoting the ability that duodenum which had been separated from rabbits had to absorb different amino acids and glucose. Jian'er syrup (the medicine for invigorating and activating the Spleen) had the effect of raising the quality of 14 mineral elements in hair; increasing the ratio of T-lymph cells in blood; increasing the index of thymus and spleen in the experimental rats and stimulating them to produce hemolysin.

9205-2912 Weinbergova, O., Dobes, P., Vavrkova, H., Ficker, L., Kvapil, L., Vesely, J., Hrubanova, Z., Kubik, Z., Hrobal, A., Podstatova, H. (Medizinische Fakultät der Palacký Universität, Medizinische Universitätsklinik mit Poliklinik, I.P. Pavlova 6, 775 20 Olomouc, Tschechoslowakei) **Digitalis therapy in practice.** *Acta Universitatis Palackianae Olomucensis (Olomouc), Facultatis Medicae*, v. 122: p. 203-212, 1989 (19 ref, Ger).

Only title translated.

9205-2913 Weinbergova, O. (Medizinische Fakultät der Palacký University in Olomouc, Medizinische Universitätsklinik mit Poliklinik, I.P. Pavlova 6, 775 20 Olomouc, Tschechoslowakei) **Digitalis therapy in congestive heart failure.** *Acta Universitatis Palackianae Olomucensis (Olomouc), Facultatis Medicae*, v. 122: p. 193-201, 1989 (26 ref, Ger).

Only title translated.

9205-2914 Yan, H.J. (Yunnan College of TCM, Kunming 650011, People's Republic of China) **Clinical and experimental study of the effect of Kang Er Xin-I on viral myocarditis.** *Chinese Journal of Integrated Traditional*

and *Western Medicine*, v. 11(8): p. 468-470, 1991 (7 ref, Chi, Eng).

Kang Er Xin-I (KEX-I) is a proved recipe used to treat viral myocarditis. It consists of *Lonicera japonica*, *Ophiopogon japonicus*, *Astragalus membranaceus* mainly and possesses the effect of clearing away heat and toxic materials and supplementing the viral energy and nourishing. The clinical study was carried out with KEX-I according to a random, paired and cross-over design. Coenzyme Q10 was used as a control and left ventricular function was observed. The result showed: after being treated with KEX-I for two weeks, the 26 patients' chief cardiac functional indexes assessed with STI improved markedly, the value of PEP/LVET and ICT/LVCT all decreased and the difference between the two groups was significant. The experimental study showed that KEX-I can inactivate directly the virus of Cocksackie B3, protect the heart cells in mice, prevent attack by Cocksackie B3, promote the growth of internal interferon and increase the NK cell's function to regulate immunity in experimental mice.

9205-2915 Zhang, G.L.(Department of Surgery TCM, The First Affiliated Hospital of Shanxi Medical College, Taiyuan 030001, People's Republic of China) **Observation on treatment of breast-proliferation-disease with modified Xia Ya San and Er Chen decoction.** *Chinese Journal of Integrated Traditional and Western Medicine*, v. 11(7): p. 400-402, 1991 (8 ref, Chi, Eng).

Treatment of 51 cases of breast proliferation diseases for 3 months with modified Xiao Yan San and Er Chen decoction, with an effective rate of 96.1 percent has been described. After treatment saliva estradiol concentrations declined very significantly, saliva progesterone concentrations declined significantly, plasma prolactin concentrations declined very significantly, but saliva testosterone concentrations did not change significantly. Breast molybdenum target X-ray films showed absorption of proliferation masses in 21 cases. This indicates that the medicine could regulate endocrine system, perhaps through suppressing secretion of plasma prolactin, decreasing prolactin antagonistic action to follicular stimulating hormone so as to restore follicle function and could regulate pituitary-follicle axis and make the axis normal.

9205-2916 Zhang, J.Q., Zhou, D.J.(Department of Endocrinology, Changhai Hospital, Second Military Medical University, Shanghai 200433, China) **Changes of leucocytic estrogen receptor levels in patients with climacteric syndrome and therapeutic effect of Liuwei Dihuang Pills.** *Chinese Journal of Integrated Traditional and Western Medicine*, v. 11(9): p. 521-523, 1991 (10 ref, Chi, Eng).

The numbers of estrogen receptor (ER) in human peripheral leucocytes in 22 women with climacteric syndrome were measured by radioligand method. The results were compared with those of 12 normal child-bearing-age women. It was found that the contents of leucocytic ER in climacteric syndrome patients were significantly lower than normal child-bearing-age women. The authors used a Chinese prescription-Liuwei Dihuang Pills (LDP) to treat the patients for 2 months. The numbers of leucocytic ER were significantly increased after treatment. The data indicate that decrease of ER levels in cell may involve in the pathogenesis of climacteric syndrome. LDP not only increases plasma estradiol levels, but also increases the leucocytic ER levels. This may be the basis of the therapeutic effect on the disease.

9205-2917 Zhao, R.F., Liu, B.(College of Stomatology, Fourth Military Medical University, Xian, Shaanxi 710032, China) **Effect of Guchi Gao on HGF and PDL in periodontal tissue cells.** *Phytotherapy Research*, v. 6(3): p. 152-154, 1992 (5 ref, Eng).

Guchi Gao is an extract of *Fructus lycii*, rhizoma *Drynariae*, radix *Rehmanniae*, *Fructus corni*, herba *Dendrobii*, radix *Ophiopogonis*, rhizoma *Alismatis*, *Cortex moutan*, *C.phellodendri*, radix *Sophorae tonkinensis* and is used as a dental tonic. The effects of eight herbs of Guchi Gao on periodontal tissue cells were investigated. Herba *Dendrobii*, radix *Ophiopogonis*, and two other herbs were found to significantly promote attachment of human gingival fibroblasts and periodontal ligament cells and enhance the proliferation of the latter. The effect of Guchi Gao for a potential treatment of periodontitis in the future has been suggested.

9205-2918 Zhou, Y., Xue, Z., Huang, Z.(Yueyang Hospital Affiliated to Shanghai College of TCM, Shanghai 200031, China) **In vitro effect of Shen-Xue-Ling on megakaryocytopoiesis in patients with idiopathic thrombocytopenic purpura.** *Chinese Journal of Integrated Traditional and Western Medicine*, v. 11(1): p. 23-24, 1991 (6 ref, Chi, Eng).

Improved methylulose-agar double layer method has been made use of in vitro to culture megakaryocyte progenitors (CFU-meg) of 15 normal bone marrow donors and 20- idiopathic thrombocytopenic purpura (ITP) patients. The results showed that the serum of patients whose PAIgG was markedly higher than the normal value inhibited growth of CFU-meg derived from normal bone marrow cells. Shen-Xue-Ling (SXL) could increase the colony of CFU-meg for ITP patients at several doses. The results suggested that SXL might inhibit the antiplatelet antibody, facilitate reproduction division and maturity of CFU-meg.

Pharmacology & Toxicology

9205-2919 Adeyemi, O.O., Ogunmakinde, A. (Department of Pharmacology, College of Medicine, University of Lagos, P.M.B. 12003, Lagos, Nigeria) **Neuromuscular effects of the aqueous extract of *Baphia nitida*.** *Planta Medica*, v. 57(Supplement 2): p. A46-A47, 1991 (4 ref, Eng).

The results of the effects of the aqueous extract of *Baphia nitida* on neuromuscular transmission using the isolated toad rectus abdominis and rat phrenic nerve-diaphragm muscle preparations are reported. The extract (5 to 100 mg/ml) produced a dose-dependent non-competitive inhibition of acetylcholine (ACH)- and KCl-induced contractures of the isolated toad rectus abdominis. The inhibitory effect on ACM induced contracture was enhanced by physostigmine (1.0 mg/ml). The results indicate that extract possesses a non-competitive skeletal neuromuscular blocking effects.

9205-2920 Akah, P.A., Okafor, C.L. (Department of Pharmacology and Toxicology, Faculty of Pharmaceutical Sciences, University of Nigeria, Nsukka, Nigeria) **Blood sugar lowering effect of *Vernonia amygdalina* Del, in an experimental rabbit model.** *Phytotherapy Research*, v. 6(3): p. 171-173, 1992 (17 ref, Eng).

The aqueous leaf extract of *Vernonia amygdalina*, given i.p. produced a dose-related fall in blood sugar. A dose of 80mg/kg body weight of adult rabbit produced a maximum lowering of blood sugar in both fasted normal and alloxanized rabbits. The fasting blood sugar in normoglycaemic rabbits was reduced from 96 mg percent to 48 mg percent in 4 h. In alloxanized rabbits, the blood sugar was reduced from the mean value of 520 mg percent to 300 mg percent in 8 h. The hypoglycaemic effects were compared with those of tolbutamide. Acute toxicity studies of the extract in mice gave LD50 value of 1122 mg/kg body weight given i.p. The blood sugar lowering effect of *Vernonia amygdalina* extract has been suggested to involve a mechanism not related to insulin secretion.

9205-2921 Alkiewicz, J., Pic, S. (Pracownia Aerozoloterapii I Kliniki Chorob Dzieci, Instytut Pediatrii Akademii Medycznej, ul. Szpitalna 27/33, 60-572 Poznan, Polska) **Modification of rheologic properties of bronchial secretion using plant drugs.** *Herba Polonica*, v. 37(1): p. 39-45, 1991 (23 ref, Eng, Pol).

A review of natural substances of plant origin showing mucolytic activity as well as of their products and therapeutical preparations has been described. Some of them are of no lower activity than synthetic products while expressing considerably lower side effects characteristic of

the latter-they are much safer drugs. Many of the plant mucolytics should be used on a much larger scale in the routine therapy, in particular in chronic and recurrent respiratory tract diseases.

9205-2922 Allens, J.G., Steele, P., Masters, H.G., Lambe, W.J. (Animal Health Laboratories, Department of Agriculture, South Perth, Western Australia 6151) **Lupinosis-associated myopathy in sheep and the effectiveness of treatments to prevent it.** *Australian Veterinary Journal*, v. 69(4): p. pp. 75-81, 1992 (33 ref, Eng).

Lupinosis-associated myopathy occurred in 26 of 48 sheep given a crude extract of *Phomopsis leptostromiformis* and in 18 of 34 sheep that grazed a toxic lupin stubble (*Lupinus* spp. Treatment with selenium or alpha-tocopherol alone neither prevented nor cured the myopathy, but selenium and alpha-tocopherol together may have been partially effective.

9205-2923 Almeida, F.R.C., Rao, V.S.N., Matos, M.E.O. (Department of Physiology and Pharmacology, Federal University of Ceara, Post Box 657, 60000, Fortaleza, Ceara, Brazil) **Antiinflammatory, antitumour and antifertility effects in rodents of two nor-cucurbitacin glucosides from *Wilbrandia* species.** *Phytotherapy Research*, v. 6(4): p. 189-193, 1992 (17 ref, Eng).

The purified fraction (PF) of the rhizome of *Wilbrandia* sp. that contained two nor-cucurbitacin glucosides (WG1 and WG2) demonstrated potent antiinflammatory, antitumour and antifertility effects in rats and mice at oral doses ranging from 50 to 200 mg/kg. In rat, it significantly inhibited carrageenan-induced hind paw oedema and granulomatous lesion, while in mice the increased vascular permeability induced by acetic acid was markedly reduced. The PF exhibited an antitumour effect in rats bearing Walker 256 carcinosarcoma and also demonstrated cytotoxic action against KB cells in vitro. In regularly cycling mice, PF treatment suppressed the incidence of the oestrus phase of the reproductive cycle suggesting a possible antiovarian effect. The PF failed to exhibit abortifacient, oestrogenic or antioestrogenic actions. The results indicate that the nor-cucurbitacin glucosides of *Wilbrandia* sp. possess a novel spectrum of pharmacological activity different from that of cucurbitacins from other plants of this family.

9205-2924 Asuzu, I.U., Njoku, J.C. (Department of Veterinary Physiology and Pharmacology, University of Nigeria, Nsukka, Nigeria) **The pharmacological properties of the ethanolic root extract of *Combretum dolichopetalum*.** *Phytotherapy Research*, v. 6(3): p. 125-128, 1992 (14 ref, Eng).

The pharmacological actions of the crude ethanolic extract and the active fractions of the roots of *Combretum dolichopetalum* were tested on guinea-pig isolated ileum and in intact rats. The extract relaxed guinea-pig ileum in a concentration-dependent manner. Two active fractions which also relaxed the guinea-pig ileum were isolated using column chromatography and TLC respectively. Both the crude extract and the active fractions inhibited the contractions induced by acetylcholine and histamine concentration-dependently in the guinea-pig ileum. The crude extract inhibited ulcers and gastric secretions induced in rats by pyloric ligation together with histamine 100 mg/kg, i.p. (p). The extract also delayed gastric emptying in rats in a dose-dependent manner.

9205-2925 Aydin, S., Ozturk, Y., Baser, K.H.C., Kirmer, N., Kurtar-Ozturk, N. (Anadolu University, Medicinal Plants Research Centre, 26470, Eskisehir, Turkey) **Effects of *Alcea pallida* L.(A.) and *Tilia argentea* Desf. ex DC infusions on swimming performance in mice.** *Phytotherapy Research*, v. 6(4): p. 219-220, 1992 (12 ref, Eng).

In Turkish folk medicine, *Alcea pallida* and *Tilia argentea* have been used for various purposes, such as expectorant, sedative, diuretic, diaphoretic, sedative activities etc. Since some of the folkloric uses may be related to anti-stress(adaptogenic) activity, the effects of fresh infusions of *A.pallida* and *T.argentea* on mouse swimming performance were investigated. On the basis of the findings, these two plants prolonged the swimming time, suggesting an antistress(adaptogenic) activity.

9205-2926 Barbera, R., Trovato, A., Rapisarda, A., Ragusa, S. (Pharmaco Biological Department, School of Pharmacy, University of Messina, Messina, Italy) **Analgesic and antiinflammatory activity in acute and chronic conditions of *Trema guineense* (Schum. et Thonn.) Ficalho and *Trema micrantha* Blume extracts in rodents.** *Phytotherapy Research*, v. 6(3): p. 146-148, 1992 (13 ref, Eng).

The analgesic activity of extracts of *Trema guineense* and *Trema micrantha* were evaluated in mice by the acetic acid induced writhing test and in rats by the hot plate method. The antiinflammatory and antiarthritic activities were evaluated in rats by the carrageenin-induced oedema assay and Newbould's adjuvant arthritis test. Pharmacological activities were compared with indomethacin. The ether and ethanol extracts of both species showed a significant analgesic activity in both tests. As regards the antiinflammatory and antiarthritic activities, the ether extract of *Trema micrantha* (1 kg of dry leaves) produced the highest percentage of inhibition of carrageenin-induced oedema and

adjuvant arthritis and this effect was comparable to that of indomethacin.

9205-2927 Bauer, R., Redl, K., Davis, B. (Institut für Pharmazeutische Biologie, Universität München, Karlstr 29, D-8000 München 2, Federal Republic of Germany) **Phytochemical and pharmacological investigations of *Bidens campylotheca*.** *Planta Medica*, v. 57(Supplement 2): p. A68, 1991 (4 ref, Eng).

From the n-hexane extract several polyacetylenes were isolated and identified as heptadeca-4,6-diyne-2E,8E,10E,16-tetraen, trideca-3E, 11E-diene-5, 7,9-triyne-1,2-diol(2) and heptadeca-4,6-diyne-2E,8Z,10E,16-tetraene. The MeOH extract was found to consist of new polyacetylene-glucosides, thalones, flavonoids (rutoside, luteolin-7-O-glucoside), chlorogenic acid, and other phenolic compounds. The n-hexane extract of *B.campylotheca* exhibited a significant inhibitory effect in the in vitro cyclooxygenase and 5-lipoxygenase assay. The IC₅₀ value of the n-hexane extract in the cyclooxygenase test was found to be 8.0 microg/ml which represents a fairly high activity. There was no significant effect for the MeOH extract.

9205-2928 Bhatt, J.P. (Department of Zoology, H N Bahuguna Garhwal University, Srinagar 246 174, Garhwal, UP, India) **Effect of piscicidal glycoside of *Aesculus indica* on developing brain of fish.** *Science & Culture*, v. 57(7): p. 176-177, 1991 (11 ref, Eng).

Juveniles of *Barilius bendelisis* treated with 21,22 diangeloylberringtonenol C based triterpene glycoside (isolated from seed coat of *A.indica*) exhibited sluggishness and jerky movement due to muscular paralysis and cerebellar degeneration. The fibre processes of purkinje neurons were degenerated in the corpus cerebelli of fish in 36 days. After 48 days, the number of neurons decreased and the perikaryon was highly diffused.

9205-2929 Chen, Z.T., GU, Z.D. (Affiliated Hospital of Shandong College of TCM, Jinan 250011, China) **The effect of herbal tonic on membrane fluidity of the mice suffered from lymphatic leukemia.** *Chinese Journal of Integrated Traditional and Western Medicine*, v. 11(1): p. 39-40, 1991 (7 ref, Chi, Eng).

Variations in membrane fluidity of red blood cell and spleen lymphocytes of the mice with lymphatic leukemia were studied by making use of herbal tonic. The results reveal that the membrane fluidity of malignant lymphocytes increased, and more pronounced in the early period of leukemia. Membrane fluidity of lymphocytes of the mice with leukemia, when treated with herbal tonic, reduced to

normal level. The result suggest that the herbal tonic could resist leukemia by reducing membrane fluidity.

9205-2930 Cheng, Y.Y., Fong, S.M., Hon, P.M., Lee, C.M., Chang, H.M. (Chinese Medicinal Material Research Centre, The Chinese University of Hong Kong, Hong Kong) **Prevention and treatment of isoproterenol induced ventricular fibrillation in rats by aqueous extract of *Salvia miltiorrhiza*.** *Chinese Journal of Integrated Traditional and Western Medicine*, v. 11(9): p. 543-546, 1991 (9 ref, Chi, Eng).

Acute fatal ventricular fibrillation (VF) was induced by subcutaneous injection of isoproterenol in rats. Pretreatment of animals, with or without pentobarbital anaesthesia, with an aqueous extract of *S.miltiorrhiza* (SM-H, i.p. 5 g herb/kg body weight) significantly reduced J-point displacement and VF survival rate was significantly raised compared with the control.

9205-2931 Chung, M.I., Teng, C.M., Cheng, K.L., Ko, F.N., Lin, C.N. (Natural Products Research Center, Kaohsiung Medical College, Kaohsiung, Taiwan 80731, Republic of China) **An antiplatelet principle of *Veratrum formosanum*.** *Planta Medica*, v. 58(3): p. 274-276, 1992 (8 ref, Eng).

Beta-sitosterol(1), trans-resveratrol(2), and a steryl alkaloidal ester, angeloylzygadenine(3) were isolated from the roots and rhizomes of *V.formosanum* and 2 and 3 were characterized by detailed spectroscopic studies trans-resveratrol strongly inhibited platelet aggregation in rabbit induced by arachidonic acid and also significantly inhibited those by ADP and collagen.

9205-2932 Corthout, J., Pieters, L., Claeys, M., Vanden Berghe, D., Vlietinck, A. (Department of Pharmaceutical Sciences, University of Antwerp, Universiteitsplein 1, B-2610 Antwerp, Belgium) **Antiviral caffeoyl esters from *Spondias mombin*.** *Phytochemistry*, v. 31(6): p. 1979-1981, 1992 (10 ref, Eng).

Two caffeoyl esters with antiviral properties were isolated from the leaves and stems of *S.mombin* by means of a bioguided assay. 2-O-Caffeoyl-(+)-allohydroxycitric acid and chlorogenic acid butyl ester showed antiviral activities against *Coxsackie* and *Herpes simplex* viruses, respectively. The latter compound was probably an artefact formed during the isolation. Chlorogenic acid showed no antiviral activity.

9205-2933 De Pasquale, R., Monforte, M.T., Trozzi, A., Raccuia, A., Tommasini, S., Ragusa, S. (Pharmaco-Biological Department, School of Pharmacy, Vill. ss. Annunziata, 98168 Messina, Italy) **Effects of leaves and shoots of *Olea***

***europaea* L. and oleuropein on experimental hypercholesterolemia in rat.** *Plantae Medicinales et Phytotherapie*, v. 25(2-3): p. 134-140, 1991 (Eng).

The effects of glycerol-alcoholic extracts of shoots and leaves of *O.europaea* and oleuropein on diet and triton hypercholesterolemia were studied in Wistar rats. It was found that the hypocholesterolemic effects of the *Olea* extracts can be ascribed to a synergic action of oleuropein and polyunsaturated fatty acids contained in the drugs.

9205-2934 Deepa Rani, K.R., Vijayammal, P.L. (Department of Biochemistry, University of Biochemistry, University of Kerala, Kariavattom P.O. Trivandrum 695 581, Kerala, India) **Effect of exposing pregnant and lactating rats to cigarette smoke on lipid metabolism in young ones.** *Indian Journal of Experimental Biology*, v. 30(3): p. 214-218, 1992 (30 ref, Eng).

The exposure of female rats to cigarette smoke during pregnancy, and lactation resulted in significant alteration in lipid metabolism in young ones. There was significant increase in the concentration of cholesterol, triglycerides and phospholipids in most of the tissues, particularly the serum, heart, liver and aorta. These lipids decreased in HDL fraction and increased in the LDL+VLDL fraction. Cholesterologenesis increased in the liver, lungs and heart as evidenced by increased activity of HMG-CoA reductase, lipogenic enzymes and increased incorporation of labelled acetate into cholesterol. Activity of lipoprotein lipase in the extra hepatic tissues and plasma LCAT decreased, and release of lipoproteins into circulation increased. There was significant decrease in the concentration of hepatic bile acids as well as excretion of fecal bile acids and neutral sterols.

9205-2935 Della Loggia, R., Sosa, S., Bianchi, P., Bombardelli, E., Tubaro, A. (Institute of Pharmacology and Pharmacognosy, University of Trieste, Trieste, Italy) **Anti-stress activity of a ginseng extract: a subchronic study in mice.** *Planta Medica*, v. 57(Supplement 2): p. A6-A7, 1991 (3 ref, Eng).

The tail suspension test, an improvement of the swimming test was used in the study. In mice suspended by the tail, alternate periods of agitation (escape behaviour) and of absolute immobility (behavioural despair) were observed and recorded. Anti-depressants put off the onset of the first immobility period (latent phase) and reduce the overall duration of immobility. From the presented data it can be concluded that the Ginseng (*Panax ginseng*) root extract 15 percent in saponins Rg 1: Rb1=1:2) possesses an anti-stress effect after subchronic administration. Moreover, the present findings may provide a rational support for a therapeutic use of Ginseng.

9205-2936 Deng, Z.M., Ye, W.Y., Li, M.Z. (Institute of Integration of TCM and WM, Tonji Medical University, Wuhan 430030, China) **Preventive effect of Re Du Qing on hepatocytes and mitochondria damaged by lipid peroxidation in experimental rabbits with endotoxin-induced DIC.** *Chinese Journal of Integrated Traditional and Western Medicine*, v. 11(2): p. 110-111, 1991 (7 ref, Chi, Eng).

In this study, the general Shwartzman reaction of rabbits induced by *Escherichia coli* endotoxin was made as DIC models. The experiments showed that the levels of lipid peroxide (LPO) in hepatic tissue and mitochondria in the model group were increased significantly compared with the control group (P less than 0.01), while superoxide dismutase (SOD) activity in hepatic tissue and glutathione peroxidase (GSH-Px) activity in hepatic tissue and mitochondria were decreased significantly (P less than 0.01). The levels of LPO in hepatic tissue and mitochondria in Re Du Qing (RDQ) group and vitamin E (VE) group were decreased significantly (P less than 0.01 and P less than 0.05 respectively) compared with the model group. The levels of LPO in the RDQ group did not differ from the control group (P greater than 0.5), but the levels of LPO in the VE group were still higher than those in the control group. The SOD activity in hepatic tissue and GSH-Px activity in hepatic tissue and mitochondria in both RDQ group and VE group were also significantly higher than in the model group (P less than 0.01). These data suggest that the levels of oxygen free radicals were increased in hepatocytes and mitochondria.

9205-2937 Dhar, J.D., Setty, B.S., Lakshmi, V.*, Bhakuni, D.S. (Divisions of Endocrinology & Medicinal Chemistry, Central Drug Research Institute, Lucknow, UP, India) **Post-coital antifertility activity of the marine plant, *Achrostichum aureum* L. in rat.** *Indian Journal of Medical Research*, v. 96B(June): p. 150-152, 1992 (5 ref, Eng).

The ethanolic extract of *A. aureum* and its fractions were evaluated for postovulatory antifertility activity in female rats. The water soluble fraction of ethanolic (95 percent) extract prevented (100 percent) pregnancy when administered to female rats on days 1-7 postcoitum. This fraction was found devoid of both estrogenic and antiestrogenic activities.

9205-2938 Duh, C.Y., Wang, S.K., Wu, Y.C. (School of Pharmacy, Kaohsiung Medical College, Kaohsiung, Taiwan, Republic of China) **Cytotoxic pyranocoumarins from roots of *Peucedanum japonicum*.** *Phytochemistry*, v. 31(5): p. 1829-1830, 1992 (5 ref, Eng).

Bioactivity-guided fractionation of a chloroform extract of the roots of *Peucedanum japonicum* has afforded a

new cytotoxic pyranocoumarin, (-)-cis-khellactone, and a known cytotoxic pyranocoumarin, (+)-cis-4'-acetyl-3'-angeloylkhellactone.

9205-2939 El Badwi, S.M.A., Adam, S.E.I., Hapke, H.J. (Department of Veterinary Medicine, Pharmacology and Toxicology, University of Khartoum, P O Box 32, Khartoum-North, Sudan) **Experimental *Ricinus communis* poisoning in chicks.** *Phytotherapy Research*, v. 6(4): p. 205-208, 1992 (17 ref, Eng).

Seven-day-old male brown Hisex chicks were fed *R. communis* seeds at concentrations of 0.5 percent and 5 percent. Mortality rates, signs, pathological changes and alterations in clinical chemistry were recorded. The results indicated that both diets containing *Ricinus* seed are fatal to chicks and that toxicity is characterized by locomotor disturbances, impaired vision, abnormal posture, growth depression, enterohepatonephropathies and anaemia. Significant increases in serum sorbitol dehydrogenase (SDH), glutamic dehydrogenase (GDH), glutamic oxaloacetic transaminase (GOT), potassium, and total hepatic and cardiac lipids, and decreases in hepatic vitamin A, serum total protein and manganese concentrations were observed in *Ricinus*-fed chicks.

9205-2940 Elkin, R.G., Rogler, J.C., Sullivan, T.W. (Department of Animal Sciences, Purdue University West Lafayette, Indiana 47907, USA) **Differential response of ducks and chicks to dietary sorghum tannins.** *Journal of the Science of Food and Agriculture*, v. 57(4): p. 543-553, 1991 (16 ref, Eng).

High-tannin sorghum (HTS)-soya bean meal and low tannin sorghum (LTS)-soya bean meal diets sub-optimal in protein with or without supplemented methionine, were administered to ducks and chicks for 14-17 days respectively. HTS fed ducks reared in floor pens exhibited reduced weight gain and feed efficiency values compared with LTS fed ducks. However, the magnitude of growth depression caused by feeding ducks HTS Vs LTS was much less than that observed in chicks fed the identical diets. Methionine supplementation of the HTS diet completely overcame the reduced weight gain in ducks. However, HTS fed chicks responded to dietary methionine supplementations, they still showed poorer weight.

9205-2941 Ellzzi, A., Benie, T., Thieulant, M., Men-Olivier, L.L., Duval, J. (Laboratoire de'Endocrinologie Moléculaire, URA CNRS 256, Campus de Beaulieu, F-35042 Rennes Cedex, France) **Stimulation of LH release from cultured pituitary cells by saponins of *Petersianthus macrocarpus*: A permeabilizing effect.** *Planta Medica*, v. 58(3): p. 229-233, 1992 (19 ref, Eng).

P. macrocarpus saponins stimulated the LH release in a dose-dependent manner (from 10 microg/ml to 300 microg/ml). When added simultaneously, saponins and LHRH exerted initial additive effects on LH release, demonstrating independent mechanisms of stimulation. If cells were pre-treated with saponins for 15 min, the amount of LH released under a subsequent LHRH stimulation was lowered, presumably due to a partial depletion of the cells in hormone. However, the action of saponins on LH release did not appear specific two highly purified saponin species were tested LH release by cultured rat pituitary cells. One of them (petersaponin I) appeared responsible for the observed biological effects in vitro. But as cells were shown to be efficiently protected from saponin effects by the presence of serum, it may be concluded that saponins of *P. macrocarpus* extracts are probably not candidate molecules promoting the in vivo estrogenic and antiestrogenic effects.

9205-2942 Englert, J., Harnischfeger, G. (Schaper & Brummer, D(W)-3320 Salzgitter 61, Federal Republic of Germany) **Diuretic action of aqueous Orthosiphon extract in rats.** *Planta Medica*, v. 58(3): p. 237-238, 1992 (7 ref, Eng).

An aqueous extract of *Orthosiphonis (O. aristatus)* folium, given orally, enhanced considerably ion excretion in rat to a level comparable to that obtained with furosemide. No aqueretic action is observed. The increased ion excretion is not due to the potassium content of the starting material.

9205-2943 Farboodniay Jahromi, M.A., Chansouria, J.P.N., Ray, A.B. (Department of Medicinal Chemistry, Institute of Medical Sciences, Banaras Hindu University, Varanasi 5, UP, India) **Hypolipidaemic activity in rats of bergenin, the major constituent of Flueggea microcarpa.** *Phytotherapy Research*, v. 6(4): p. 180-183, 1992 (23 ref, Eng).

Oral administration of bergenin, isolated from the leaves of *Flueggea microcarpa*, to hyperlipidaemic rats for 14 days significantly decreased serum total lipid without much change in serum cholesterol and triglycerides. However, after 21 days of administration, the serum cholesterol, triglycerides, low-density lipoprotein (LDL) and very low-density lipoprotein (VLDL)-cholesterol levels were significantly reduced while the serum high-density lipoprotein (HDL)-cholesterol level was elevated. Bergenin-treated animals also showed a significant decrease in atherogenic index.

9205-2944 Fu, H., He, Y. (Institute of Chinese Materia Medica, China Academy of TCM, Beijing 100700, China) **Studies on the hidropoiesis of the decoction of Gui-Zhi tang in mice and rats.** *Chinese Journal of Integrated*

Traditional and Western Medicine, v. 11(1): p. 34-36, 1991 (4 ref, Chi, Eng).

Effects of decoction of Gui-Zhi-Tang (DGZT) on the hidropoiesis of animal paw in different pathophysiological conditions were studied. The diaphoresis was found in normal rats when 2.5-10.0 gm crude drugs/kg p.o. of DGHT was administered. The decoction had the action of bi directional regulation and normalisation in polyhidrosis induced by aminopyrines or in hypohidrosis induced by atropine on rats..

9205-2945 Gajendragad, M.R., Gopalakrishna, S. Ravikumar, S.B. (Indian Veterinary Research Institute, Hebsal, Bangalore 560024, Karnataka, India) **Pathology of the brain in acute hydrocyanic acid poisoning in sheep.** *Indian Veterinary Journal*, v. 69(3): p. 206-210, 1992 (Eng).

A herd of 150 sheep ate the pods from a tree belonging to *Acacia* genus. Within a few minutes, the animals started showing signs of toxicity and some of them died. Acute HCN poisoning was the cause of poisoning. The pathology of the brain in these animals has been described..

9205-2946 Ganguli, C., Das, S. (Department of Experimental Leukaemia, Chittaranjan National Cancer Institute, Calcutta, WB, India) **Antitumor activity of two plant lectins.** *Indian Journal of Cancer Chemotherapy*, v. 13(2): p. 41-44, 1991 (8 ref, Eng).

The effect of two plant lectins viz., soyabean agglutinin (SBA) and wheat germ agglutinin (WGA) on the growth and progression of Dalton's lymphoma- a murine ascitic tumor has been examined. Both the lectins were found to possess antitumor action, which could arrest tumor cell growth, delay progression of tumor and improve host survival. While WGA was found to inhibit tumor cell DNA synthesis SBA had no such action. NSL, New Delhi.

9205-2947 Gawron, A., Kruk, I. (Department of Cell Biology, University of Maria Curie-Sklodowska, Akademicka 19, 20-033 Lublin, Poland) **Cytotoxic effect of xanthotoxol (8-hydroxypsoralen) on TCTC cells in vitro.** *Polish Journal of Pharmacology and Pharmacy*, v. 44(1): p. 51-57, 1992 (16 ref, Eng).

The effect of xanthotoxol on proliferation of TCTC cells in vitro has been studied. Xanthotoxol at concentrations of 5 to 50 micro g/ml inhibited the growth of cells. In cultures with xanthotoxol, decreased amount of cell protein, mitotic index, and decreased ability to form a colony, were observed. Moreover, xanthotoxol disturbed mitoses elevating the number of mitotic cells in the telophase stage. An increase of giant and multinuclear cells was also found. It can be concluded that xanthotoxol is not sensitive to photos-

timulation, inhibits the cell proliferation. Thus the mechanism of the psoralens activity is independent from the photostimulation.

9205-2948 Gilani, Anwar-ul-Hassan (Department of Pharmacology, Faculty of Health Sciences, The Aga Khan University Medical College, Karachi 74800, Pakistan) **Effect of alkaloids from *Galbulimima baccata* on guinea-pig ileum.** *Fitoterapia*, v. 63(3): p. 238-242, 1992 (5 ref, Eng).

Four alkaloids (himbacine, himbadine, himgaline, himbosine) isolated from *G.baccata* were studied for their spasmolytic activity on isolated guinea-pig ileum. Only himbacine and himbadine were found active, himbacine being more potent. Himbacine revealed a specific atropine-like blockade of acetylcholine responses and additional non-specific papaverine-like spasmolytic action against histamine and barium chloride.

9205-2949 Giner, R.M., Sanz, M.J., Ferrandiz, M.L., Recio, M.C., Terencio, M.C., Rios, J.L. (Departamento de Farmacologia, Facultad de Farmacia, Universidad de Valencia, Valencia, Spain) **Topical antiinflammatory activity of some iridoids and phenylpropanoids.** *Planta Medica*, v. 57(Supplement 2): p. A53, 1991 (1 ref, Eng).

The compounds isolated were: lamiide from *Phlomis crinita*, logamin and iridoid 1 (unidentified iridoid) from *Lonicera implexa* and acteoside, iridoid 2, iridoid 3 (two unidentified iridoids). Iridoid 4 {mixture of two iridoids, 6-O-(2"-O-acetyl-3",4"-di-p-methoxycinnamoyl-alpha-L-rhamnopyranosyl)-catapol and 6-O-(2",3"-O-di-p-methoxycinnamoyl-4"-O-acetyl-alpha-L-rhamnopyranosyl)-catapol} from *Scrophularia auriculata*. Mouse ear edema was induced by tetradecanoylphorbol acetate (TPA, 2.5 microg/ear). All mixture of the two catapol derivatives (iridoid 4) showed the highest antiinflammatory activity. When these products were assayed at the same dose as indomethacin, they exhibited nearly the same effect as this reference drug, with an edema percentage inhibition of 73.4 percent.

9205-2950 Glaeser, S., Hecker, E. (Deutsches Krebsforschungszentrum, Institut für Biochemie, Im Neuenheimer Feld 280, D-6900 Heidelberg, Federal Republic of Germany) **Drugs from Euphorbiaceae and Thymelaeaceae as possible health hazards: phytotherapeutics derived from *Croton tiglium*-an iatrogenic risk of cancer?.** *Planta Medica*, v. 57(Supplement 2): p. A50-A51, 1991 (5 ref, Eng).

Four drugs namely three brands of Baunscheidtol (containing croton oil) and the mother tincture of *C.tiglium* were investigated after separation of phorbol esters(P&S)

and phorbol diesters(PD&S) and their transesterification to the corresponding parent alcohol phorbol. From the total phorbols, the corresponding TPA(12-O-tetradecanoylphorbol-13-acetate) equivalents were calculated. The concentrations of P&S and PD&S in mother tincture and in three different brands of drug range from 0.13 to 1.8 percent. TPA was also quantified in different drugs. All drugs stimulated luminol mediated chemoluminescence in mouse granulocytes and exhibited tumor promoting activity comparable to the known activity of TPA and croton oil.

9205-2951 Gminski, R., Hecker, E. (Deutsches Krebsforschungszentrum Heidelberg, Institut für Biochemie, Im Neuenheimer Feld 280, D-6900 Heidelberg, Federal Republic of Germany) **Drugs from Euphorbiaceae and Thymelaeaceae as possible health hazards: homeopathics derived from *Euphorbia cyparissias* and *Daphne mezereum*-An iatrogenic risk of cancer?.** *Planta Medica*, v. 57(supplement 2): p. A50, 1991 (6 ref, Eng).

Nine commercial homeopathics - five containing *E.cyparissias* derived from the mother tincture (HAB 1), three containing *Mezereum* derived from the mother tincture (HAB 1) and one containing *Mezereum TM* from a French pharmaceutical producer-were tested. In all assay systems most of them elicited at low doses positive responses of various degrees. Therefore they are highly suspicious to exhibit tumor promoting activity in mouse skin in vivo. Their content of tumor-promoting diterpene esters was estimated. The results suggest that in the animal model the tincture of *E.cyparissias* must be considered as an iatrogenic risk of tumor promotion. In human therapy at least chronic exposure to this tincture should therefore, be avoided.

9205-2952 Gundidza, M. (Department of Pharmacy, Faculty of Medicine, University of Zimbabwe, PO Box MP 167, Mount Pleasant, Harare, Zimbabwe) **Effect of methanol extract from *Monadenium lugardiae* on contractile activity of guinea-pig ileum.** *Central African Journal of Medicine*, v. 37(5): p. 141-143, 1991 (11 ref, Eng).

A methanol extract from *M.lugardiae* was tested for contractile activity on the guinea-pig ileum using the transmural stimulation method. Results obtained showed that the extract exhibited notable activity on the guinea-pig ileum contraction. Higher concentrations, however, showed inhibitory effect on the guinea-pig ileum contraction as well as its response to transmural stimulation.

9205-2953 Gustafson, K.R., Cardellina II, J.H., McMahon, J.B., Pannell, L.K., Cragg, G.M., Boyd, M.R. (Laboratory of Drug Discovery Research and Development, Developmental Therapeutics Program, Division of Cancer Treatment, National Cancer Institute, Building 1052, Room 121, Frederick, Maryland 21702-1201, USA) **Peltatols,**

novel HIV-inhibitory catechol derivatives from Pothomorphe peltata. *Journal of Organic Chemistry*, v. 57(10): p. 2809-2811, 1992 (8 ref, Eng).

Three new prenylated catechol dimers have been isolated from the tropical shrub *R.peltata*. The structures of peltatol A, peltatol B, and peltatol C were determined by extensive spectroscopic analyses. Peltatols A-C inhibited HIV-1 induced cell killing at subcytotoxic concentrations of 1-10 micro g/mL. The monomeric catechol derivative 4-nerolidylcatechol was active in a phorbol receptor binding assay (IC₅₀=35 micro g/mL) but inactive against HIV. The diphenyl ethers, peltatols B and C, were interconvertible in solution (MeOH, DMSO) at room temperature.

9205-2954 Hadacek, F., Harmala, P., Tornquist, K., Vuorela, H. (Department of Comparative Phytochemistry, Institute of Botany, University of Vienna, Rennweg 14, A-1030 Vienna, Austria) **Calcium antagonistic activity of five coumarins and one 2-methylchromone from Peucedanum species.** *Planta Medica*, v. 57(Supplement 2): p. A53-A54, 1991 (6 ref, Eng).

Five coumarins and one-methylchromone were isolated from the roots of four species of *Peucedanum* namely *P.arenarium*, *P.officinale*, *P.oreoselinum*, *P.austriacum* were tested for calcium antagonistic activity. Of the compounds isolated ahamantin had IC₅₀ value of 1.6 microg/ml and was found most active one.

9205-2955 Harmala, P., Vuorela, H., Tornquist, K., Kaltia, S., Galambosi, B., Hiltunen, R. (Pharmacognosy Division, Department of Pharmacy, University of Helsinki, Fabianinkatu 35, SF-00170 Helsinki, Finland) **Isolation and testing of the calcium blocking activity of furanocoumarins from Angelica archangelica.** *Planta Medica*, v. 57(Supplement 2): p. A58-A59, 1991 (4 ref, Eng).

Isolation of eleven furanocoumarins from the chloroform extract of the *A.archangelica* roots was carried out using the "PRISMA" system for optimizing the mobile phases for normal phase and reversed phase medium pressure liquid chromatography. The calcium antagonistic effect of the isolated coumarins was investigated by measuring the inhibition of depolarization induced Ca²⁺ uptake in GH4C1 rat pituitary cells. The coumarins were: archangelicin, bergapten, imperatorin, isoimperatorin, isopimpinellin, osthol, ostruthol, oxypeucedanin, oxypeucedanin hydrate, phellopterin and xanthotoxin. Archangelicin had an IC₅₀ value of 1.2 microg/ml and was the most active of coumarins tested. All the coumarins had a significant calcium antagonistic activity.

9205-2956 He, W., Zhao, T., Liu, H., Wang, X., Yang, J., Zhao, R., Wang, D., Kang, Y. (Saanxi Institute of Animal Science and Veterinary Medicine Science, Xianyang, Shaanxi, China) **Study on the effect of a Chinese drug Silybum marianum (L.) Gaertn. on preventing and treating fatty liver syndrome in chickens.** *Chinese Journal of Animal and Veterinary Sciences*, v. 22(3): p. 238-243, 1991 (7 ref, Chi, Eng).

S.marianum has been found to exhibit a stabilizing effect on liver cell membrane in chickens. The effect on reduction of fatty degeneration in liver was significant. The treatment rate of fatty liver syndrome in chickens was 80.0 percent, improved 13.3 percent and no effect 6.7 percent. Based on the results it would be an ideal drug to prevent and treat fatty liver syndrome..

9205-2957 Herrera, M.D., Marhuenda, E. (Laboratoire de Pharmacognosie et Pharmacodynamie, Faculte de Pharmacie, Universite de Sevilla, Espagne) **Spasmolytic activity of Genista tridentata L..** *Plantes Medicinales et Phytotherapie*, v. 25(2-3): p. 147-156, 1991 (18 ref, Eng, Fre).

Spasmolytic activity of the methanol extract of *G.tridentata* and of the isoflavone genistein isolated from it was studied in isolated guinea-pig ileum. Both exhibited a pronounced inhibitory effect of the barium chloride and histamine dihydro chloride induced contractions.

9205-2958 Higuchi, H., Kinjo, J., Nohara, T. (Faculty of Pharmaceutical Sciences Kumamoto University, Oe-honmachi 5-1, Kumamoto 862, Japan) **An arrhythmic-inducing glycoside from Albizzia julibrissin Durazz. IV.** *Chemical & Pharmaceutical Bulletin*, v. 40(3): p. 829-831, 1992 (4 ref, Eng).

Pyridoxine derivatives have been isolated from the fresh stem bark of *A.julibrissin*. One of them, viz., julibrin II, was found to exhibit arrhythmic-induction action in frog heart.

9205-2959 Houghton, P.J., Osibogun, I.M., Bansal, S. (Pharmacognosy Research Laboratories, Chelsea Department of Pharmacy, King's College London, Manresa Road, London SW3 6LX, UK) **A peptide from Schuman-niophyton magnificum with anti-cobra venom activity.** *Planta Medica*, v. 58(3): p. 263-265, 1992 (6 ref, Eng).

Using the chick biventer cervicis preparation as a bioassay for antivenom activity, a peptide has been isolated from the aqueous extract of the bark of *S.magnificum*. The peptide was isolated and purified by a combination of reverse-phase and exclusion column chromatography, preparative TLC, and HPLC. The peptide has a relative molecular mass of about 6000 daltons and is similar in

amino acid composition to the cardiotoxins present in snake venom. The isolated peptide showed dose-related inhibitions of the effects of cardiotoxin and total venom of cobra species using the chick biventer cervicis preparation.

9205-2960 Itami, T., Ema, M., Sakamoto, J., Hosoda, K., Noguchi, M., Kawasaki, H. (National Institute of Hygienic Sciences, Osaka Branch, 1-1-43, Hoenzaka, Chuo-ku, 540, Japan) **Antipyretic effects of traditional Chinese medicines in bacterial endotoxin-induced febrile rabbits.** *Yakugaku Zasshi*, v. 112(2): p. 129-134, 1992 (28 ref, Jap, Eng).

The antipyretic effects of oral administration of eight traditional Chinese medicines (dried extracts) were tested in febrile rabbits injected with bacterial pyrogen, lipopolysaccharide (LPS) 0.05 microg/kg (i.v.). The traditional Chinese medicines were given 0.6-2 g/10 ml/kg (p.o) simultaneously with LPS. The most potent antipyretic effect was observed in Dai-ji-yoki-to (Ta-chen-chi-tang). The moderate antipyretic effects were observed in Tokisyakuyaku-san (Tang-kuei-shao-yao-san) and Syo-saiko-to (Hsiao-chai-hutang. Koso-san (Hsiang-su-san), Oren-gedoku-to (Huang-lien-chieh-tu-tan), Gorei-san (Wu-ling-san), Kakkon-to (Ko-ken-tang) and Byakkoka-ninjin-to (Pai-hu-chia-jen-sheng-tang) showed no effects.

9205-2961 Jain, A.K., Sethi, N. (Division of Toxicology, Central Drug Research Institute, Chattar Manzil Palace, P Box 173, Lucknow 226 001, UP, India) **Effect of Picroliv, a hepatoprotective agent prepared from Picrorhiza kurroa, on mice chromosomes.** *Fitoterapia*, v. 63(3): p. 255-257, 1992 (13 ref, Eng).

Picroliv, a hepatoprotective agent prepared from *P.kurroa*, was assayed for its effects on mice chromosomes in bone marrow cells. Treatment of mice with 0.1, 1.0 and 10.0 mg/kg b.w. per os did not enhance the magnitude of chromosomal aberrations and therefore Picroliv seems to be devoid of clastogenic activity.

9205-2962 Jaiswal, A.K., Bhattacharya, S.K. (Neuropharmacology Laboratory, Department of Pharmacology, Institute of Medical Sciences, BHU, Varanasi 221005, UP, India) **Effects of Shilajit on memory, anxiety and brain monoamines in rats.** *Indian Journal of Pharmacology*, v. 24(1): p. 12-17, 1992 (18 ref, Eng).

The effect of Shilajit was investigated for putative nootropic and anxiolytic activity and its effect on rat brain monoamines using Charles Foster strain albino rats. Anxiolytic activity was evaluated by the elevated Plus-maze techniques. The result showed that Shilajit had significant nootropic and anxiolytic activity. Acute treatment with Shilajit had insignificant effects on rat brain monoamine and

monoamine metabolite levels. With subacute treatment for 5 days there was a decrease in 5-hydroxy tryptamine and 5-hydroxy indole acetic acid concentrations and an increase in the levels of dopamine, homovanillic acid and 3-hydroxy phenylacetic acid concentrations.

9205-2963 Jiang, Y., Beck, J.P., Italiano, L., Haag, M., Anton, R. (Laboratoire de Pharmacognosie, Faculté de Pharmacie, BP 24, F-67401 Illkirch Cedex, France) **Biological effects of the saponins from *Mimosa tenuiflora* on fibroblast cells in culture.** *Planta Medica*, v. 57(Supplement 2): p. A38, 1991 (3 ref, Eng).

From the bark of *M.tenuiflora* two new oleanolic acid glycosides: mimonosides A(Ma) and B(Mb) were isolated and were added at the concentration of 30micro M to fibroblast cell cultures. The saponins Ma and Mb showed cytotoxic properties on mouse fibroblast cells and stimulated the multiplication of human fibroblast cells, obtained from the breast skin. These biological effects can possibly explain the traditional use of the bark of this species to treat different skin lesions.

9205-2964 Juzwiak, S., Rainska, T., Dutkiewicz, T., Cioch, U., Olenderek, B., Krasowska, B., Rozewicka, L., Juzyszyn, Z., Wojcicki, J., Samochowiec, L. (Institute of Pharmacology and Toxicology, Department of Clinical Biochemistry, Medical Academy, Powstancow Wielkopolskich 72, 70-111 Szczecin, Poland) **Pollen extracts reduce the hepatotoxicity of paracetamol in mice.** *Phytotherapy Research*, v. 6(3): p. 141-145, 1992 (21 ref, Eng).

Cernitins are preparations obtained from plant pollen which contain numerous compounds of potential biological significance. The influence of cernitins upon acute paracetamol toxicity in mice has been reported. The survival rate and indices of hepatic injury: aminotransferase and alkaline phosphatase activities, bilirubin level in serum, glutathione and cytochrome P450 content in liver, liver weight, histopathology of liver and presence of glycogen and lipids in stained liver sections, under different experimental protocols, were determined. Cernitins were able to increase the survival rate of mice and reduce liver injury in acute paracetamol poisoning. Cernitins were more effective when administered after, rather than before, a dose of paracetamol. The possible mechanism through which cernitins act is discussed.

9205-2965 Kamanyi, A., Bopelet, M., Tatchum, T.R. (Animal Physiology Laboratory, Faculty of Science, B.P. 812 Yaounde, Cameroon) **Contractile effect of some extracts from the leaves of *Musanga cecropioides* (Cecropiaceae) on uterine smooth muscle of the rat.**

Phytotherapy Research, v. 6(3): p. 165-167, 1992 (14 ref, Eng).

Portions of the hot water extract, chloroform and n-butanol fractions of the leaves of *M. cecropioides* were used to challenge uterine strips from nonpregnant and early stage pregnant (3-8 days) female Wistar rats. Uterine strips were obtained from oestrogenized females. The aqueous and n-butanol extracts (10 mg/L) showed marked uterotonic effects which were more pronounced in the pregnant females. These contractile effects were dose-dependent and comparable to oxytocin and acetylcholine (100 microg/mL) but were all antagonized by ethanol. These effects have been accounted for the abortifacient properties of the extracts.

9205-2966 Kang, Y., Guo, S., Wu, X.Z. (Department of Pharmacology, Tianjin Medical College, Tianjin 300 070, China) **Study of Da Cheng Qi Tang on ^{45}Ca content of the isolated colon smooth muscle from experimental colon obstruction rats.** *Chinese Journal of Integrated Traditional and Western Medicine*, v. 11(2): p. 107-109, 1991 (5 ref, Chi, Eng).

Da Cheng Qi Tang (DCQT) is a classical prescription of Chinese medicine for treatment of acute intestinal obstruction. In this paper, the isolated colon smooth muscle from normal and experimental colon obstruction (CO) rats were used to study the effect of DCQT on ^{45}Ca content. The results showed that the ^{45}Ca content on isolated colon smooth muscle ($\mu\text{m/g}$ wet tissue, X \pm S) was 0.043 ± 0.009 in the normal and 0.057 ± 0.012 in those treated by DCQT respectively. The content of ^{45}Ca in CO was higher than the normal, DCQT can reduce the content of ^{45}Ca in CO. It is known that the higher level of intracellular Ca^{2+} is related to the formation and the development of acute intestinal obstruction. The inhibitory effect of DCQT on ^{45}Ca content may play an important role in the treatment of acute colon obstruction.

9205-2967 Kataoka, M., Takagaki, Y. (Osaka Prefectural Institute of Public Health, 1-3-69, Nakamichi, Higashinari-ku, Osaka 537, Japan) **Screening of the crude drugs having the antiallergic effect using rat basophilic leukemia cells (RBL-2H3).** *Shoyakugaku Zasshi*, v. 46(1): p. 25-29, 1992 (13 ref, Eng, Jap).

Advantageous method using rat basophilic leukemia cells for the screening of the crude drugs having an antiallergic effect was established. The inhibitory effects of the extracts of 109 kinds of crude drugs on the beta-hexosaminidase release from RBL-2H3 cells stimulated with biotinyl IgE-avidin complex were examined. The water and 50 percent methanol extracts of 15 crude drugs inhibited the beta-hexosaminidase release and the inhibitions were dose dependent. In the case of *Aloe* and *Angelica*

dahurica radix, the water extracts showed the inhibitory effect on the beta-hexosaminidase release but the 50 percent methanol extracts did not.

9205-2968 Khan, R.A., Onkar Singh (Department of Pharmacology, Aligarh 202 002, UP, India) **Antidiabetic profile of *Momordica charantia*.** *Hamdard Medicus*, v. 35(1): p. 76-79, 1992 (21 ref, Eng).

Hypoglycemic activity of *M. charantia* has been reported. It has been reported to raise the blood glucose level and improve glucose absorption. The drug has been reported to be rich in minerals, vitamins and trace elements.

9205-2969 Kimura, M., Kimura, I., Guo, X., Luo, B., Kobayashi, S. (Department of Chemical Pharmacology, Faculty of Pharmaceutical Sciences, Toyama Medical and Pharmaceutical University, Toyama 930-01, Japan) **Combined effects of Japanese-Sino medicine 'Kakkon-to-ka-senkyu-shin'i' and its related combinations and component drugs on adjuvant-induced inflammation in mice.** *Phytotherapy Research*, v. 6(4): p. 209-216, 1992 (11 ref, Eng).

Kakkon-to-ka-senkyu-shin'i (KKS), a Japanese-Sino medicine consists of nine crude drugs: pueraria, ephedra, cnidium, magnolia, cassia, peony, liquorice, ginger and jujube. The antiinflammatory effects of KKS, its related combinations, and component crude drugs were investigated on adjuvant-induced air pouch granuloma in mice. KKS was effective in inhibiting the inflammatory process of pouch fluid exudation, inflammatory cell migration and angiogenesis. The main component crude drugs and combination in KKS for antiinflammation were magnolia and pueraria for angiogenesis, magnolia and ephedra for pouch fluid exudation, and pueraria+ephedra+cnidium+magnolia for inflammatory cell migration.

9205-2970 Kiuchi, F., Iwakami, S., Shibuya, M., Hanaoka, F., Sankawa, U.* (Faculty of Pharmaceutical Sciences, The University of Tokyo, 7-3-1, Hongo, Bunkyo-ku, Tokyo 113, Japan) **Inhibition of prostaglandin and leukotriene biosynthesis by gingerols and diarylheptanoids.** *Chemical & Pharmaceutical Bulletin*, v. 40(2): p. 387-391, 1992 (22 ref, Eng).

The rhizomes of *Zingiber officinale* and *Alpinia officinarum* contain potent inhibitors against prostaglandin biosynthesizing enzyme (PG synthetase). Gingerols and diarylheptanoids were identified as active compounds. Their possible mechanism of action which was deduced from the structures of active compounds indicated that the inhibitors would also be active against arachidonate 5-lipoxygenase, an enzyme of leukotriene biosynthesis. This was verified by testing their inhibitory effects on 5-

lipoxygenase prepared from RBL-1 cells. A diarylheptanoid with catechol group was the most active compound against 5-lipoxygenase, while yakuchinone A was the most active against PG synthetase..

9205-2971 Kolar, Z., Chylek, V., Dolezalova, V. (Department of Pathology, Medical Faculty, Palacky University, Dr S. Allende 3, 775 15 Olomouc, Czechoslovakia) **Lectin histochemistry during sarcomatoid reversal of the tumor cell line RMT-2.** *Acta Universitatis Palackianae Olomucensis (Olomouc), Facultatis Medicae*, v. 125: p. 67-71, 1990 (Recd. 1992, 6 ref, Eng, Cze).

The alterations in the content of free sugar residues were studied in the samples of the experimentally induced rat breast carcinoma in the course of sarcomatoid reversal. Glycosylation alterations were determined by immunohistochemical methods detecting the binding sites for lectins from *Arachis hypogaea*, *Canavalia ensiformis*, *Dolichos biflorus*, *Triticum vulgare* and *Ulex europaeus*. The results indicate that the content of most studied saccharides decreases in the course of sarcomatoid development.

9205-2972 Kolar, Z., Altavilla, G. (Department of Pathological Anatomy, Medical Faculty, Palacky University, S. Allende 3, 775 15 Olomouc, Czechoslovakia) **Glycosylation in human colorectal mucosa during tumor development studied by lectins.** *Acta Universitatis Palackianae Olomucensis (Olomouc), Facultatis Medicae*, v. 122: p. 127-136, 1989 (30 ref, Eng, Cze).

Six lectins from *Arachis hypogaea*, *Canavalia ensiformis*, *Dolichos biflorus*, *Ricinus communis tox*, *Triticum vulgare* and *Ulex europaeus* have been used for demonstration of glycosylative changes in the hyperplastic, adenomatous and carcinomatous mucosa of large bowel. The results obtained were rather heterogenous with regard to lectin binding capacity in the single cases but they proved a certain uniformity of changes inside every tested group. These changes cohered with decrease of capability of dysplastic and neoplastic cells to produce normal goblets and with loss of cell polarity.

9205-2973 Kolar, Z., Negrini, R., Lisato, L. (Department of Pathological Anatomy, Medical Faculty, Palacky University, S. Allende 3, 775 15 Olomouc, Czechoslovakia) **Effect of some sugars on the growth and differentiation of MCF-7 cells: 1. Detection of glycosylative changes using lectin histochemistry.** *Acta Universitatis Palackianae Olomucensis (Olomouc), Facultatis Medicae*, v. 122: p. 113-120, 1989 (14 ref, Eng, Cze).

The effect of lactose, L-fucose, and D-glucose on differentiation and glycosylation of MCF-7 cells from human mammary cancer were tested. For determination of

glycosylation, six lectins from *Arachis hypogaea*, *Canavalia ensiformis*, *Dolichos biflorus*, *Ricinus communis tox*, *Triticum vulgare* and *Ulex europaeus* with various binding specificity were used. The majority of lectins showed an increased binding ability to secretory vacuoles and vesicles in the presence of L-fucose.

9205-2974 Kolar, Z., Negrini, R. (Department of Pathological Anatomy, Medical Faculty, Palacky University, S. Allende 3, 775 15 Olomouc, Czechoslovakia) **Lectin histochemistry in the estradiol stimulated and nonstimulated MCF-7 cells.** *Acta Universitatis Palackianae Olomucensis (Olomouc), Facultatis Medicae*, v. 122: p. 121-126, 1989 (11 ref, Eng, Cze).

Six lectins from *Arachis hypogaea* (PNA), *Canavalia ensiformis* (Con A), *Dolichos biflorus* (DBA), *Ricinus communis tox* (RCAGO), *Triticum vulgare* (WGA) and *Ulex europaeus* (UEA1) have been investigated for their binding affinity to MCF-7 cells stimulated and nonstimulated by estradiol. Except UEA-1 and Con A, all lectins (PNA, DBA, RCAGO, WGA) showed the prevalent binding affinity to cytoplasm of polygonal cells in the centre of colonies. These cells differentiated more rapidly in non-stimulated cultures and intensity of their staining depended on cultivation time. Con A bound all cells and was independent of estradiol concentration.

9205-2975 Konoshima, T., Kokumai, M., Kozuka, M., Iinuma, M., Mizuno, M., Tanaka, T., Tokuda, H., Nishino, H., Iwashima, A. (Kyoto Pharmaceutical University, Nakauchi-cho, Misasagi, Yamashina-ku, Kyoto 607, Japan) **Studies on inhibitors of skin tumor promotion. XI. Inhibitory effects of flavonoids from *Scutellaria baicalensis* on Epstein-Barr virus activation and their anti-tumor-promoting activities.** *Chemical & Pharmaceutical Bulletin*, v. 40(2): p. 531-533, 1992 (10 ref, Eng).

To search for possible anti-tumor-promoters, fourteen flavones obtained from the root of *S. baicalensis* were examined for their inhibitory effects on the Epstein-Barr virus early antigen (EBV-EA) activation by a short-term in vitro assay. Among these flavones, 5,7,2'-trihydroxy- and 5,7,2',3'-tetrahydroxyflavone showed remarkable inhibitory effects on the EBV-EA activation, and the effect of the latter on Raji cell cycle was also examined by flow cytometer. These two flavones exhibited remarkable inhibitory effects on mouse skin tumor promotion in an in vivo two-stage carcinogenesis test..

9205-2976 Kunapuli, S.P., Vaidyanathan, C.S.* (Department of Biochemistry, Indian Institute of Science, Bangalore 560012, Karnataka, India) **New indole oxygenase from the leaves of *Tecoma stans* L. Part II.**

Immunological characterization. *Journal of the Indian Institute of Science*, v. 71(6): p. 515-522, 1991 (23 ref, Eng).

Antibodies raised against indole oxygenase from the leaves of *T.stans* did not crossreact with indole oxygenase from *Jasminum grandiflorum*. *Tecoma* indole oxygenase-IgG immunoprecipitate has retained 90 percent of the original activity. The K_m and V_{max} of indole oxygenase in the immuno complex were comparable to those of the free enzyme. The enzyme was protected against heat inactivation by antibodies in the immunoprecipitate.

9205-2977 Lastowski, Z., Siwiec, V., Jedynek, A. (Department of Pharmacodynamics, Medical Academy, Staszica 4, 20-081 Lublin, Poland) **Reserpine ulcers in morphine dependent and withdrawal rats.** *Polish Journal of Pharmacology and Pharmacy*, v. 44(1): p. 4' 1992 (29 ref, Eng).

Reserpine ulcers were produced in dependent and withdrawal rats. The reactivity of isolated duodenum and colon to morphine and papaverine was tested in both groups of animals. Chronic administration of morphine decreases the development of post reserpine gastric ulcers, while in withdrawal rats it increases their occurrence. Relaxation and contraction responses of duodenum taken from the dependent rats showed tolerance. On the other hand, withdrawal rats displayed increased responses as compared with placebo group. Colon of dependent rats showed stronger responses to morphine and papaverine which indicates the lack of tolerance to morphine or enhanced receptors sensitivity. Stronger responses of colon in both dependent and withdrawal rats suggest the lack of tolerance in this segment of the gut. In withdrawal rats which obtained reserpine and placebo responses to papaverine were similar. It is suggested that reserpine decreased the sensitivity of mu receptor to morphine.

9205-2978 Latha, M.S., Vijayammal, P.L., Kurup, P.A. (Department of Biochemistry, University of Kerala, Kariavattom, Trivandrum 695581, Kerala, India) **Effect of nicotine on glycosaminoglycan metabolism in rats.** *Indian Journal of Experimental Biology*, v. 30(3): p. 219-223, 1992 (22 ref, Eng).

Cigarette smoking has been established as a major risk factor for atherosclerosis and also for lung cancer. Nicotine is one of the major components of cigarette smoke which is believed to be partly responsible for the deleterious effect of cigarette smoke. There was significant alteration in the concentration of glycosaminoglycans (GAG) in rats exposed to cigarette smoke. Administration of nicotine to rats has been found to decrease many of GAG fractions in the aorta, liver and heart and increase in the lungs. The increase in GAG now observed in lung tissue in rats administered

nicotine and those exposed to cigarette smoke may be involved in the increased incidence of lung cancer in smokers. Increased activity of many of GAG hydrolysing enzymes indicates increased degradation of GAG. Sulphate metabolism in the liver is also significantly altered by nicotine. Administration of nicotine to rats caused alteration in the metabolism of GAG which were similar to those observed on exposure of rats to cigarette smoke.

9205-2979 Lee, I.R., Kim, J.S., Lee, S.H.* (College of Pharmacy, Ewha Womans University, Korea) **Pharmacological activities of leaves of *Hedera rhombea* bean.** *Korean Journal of Pharmacognosy*, v. 23(1): p. 34-42, 1992 (9 ref, Eng).

The analgesic, anticonvulsant and antiinflammatory activities of leaves of *H.rhombea* in mice were evaluated. The methanol and butanol fractions showed considerable analgesic activity, but no anticonvulsant activities. Antiinflammatory activity was found in the methanol, butanol and ether fractions by carragenin induced edema test.

9205-2980 Li, X.P. et al (Beijing College of Acupuncture and Moxibustion and Traumatology, Beijing 100 015, People's Republic of China) **Experimental study on anti-senility of the four famous Chinese herbs produced in Huaiqing area.** *Chinese Journal of Integrated Traditional and Western Medicine*, v. 11(8): p. 486-487, 1991 (9 ref, Chi, Eng).

The effects of each of the four famous Chinese herbs and their combination on the activity of superoxide dismutase (SOD), catalase (CAT), glutathione peroxidase (GSH-Px) and lipid peroxide (LPO) in the blood of young mice were studied. These four herbs were *Radix Achyranthis bidentatae*, *flos Chrysanthemi*, *Rhizoma Dioscoreae* and *Radix Rehmanniae*. The results indicated that the combination of the four herbs can evidently increase the activity of SOD and GSH-Px, and can apparently reduce LPO in the blood of young mice. Even each of the four herbs alone can increase the activity of GSH-Px and reduce LPO. It is indicated that these four famous Chinese herbs have the effects on anti-senility.

9205-2981 Liu, Q.S., Wang, C.H. (Shaanxi Provincial Institute of Integrated Traditional Chinese and Western Medicine, Xian 710068, People's Republic of China) **A study on the effect of Xin-Fu-Ning IV on experimental congestive heart failure in rabbits.** *Chinese Journal of Integrated Traditional and Western Medicine*, v. 11(8): p. 482-483, 1991 (9 ref, Chi, Eng).

Congestive heart failure (CHF) was produced by the use of pentobarbital sodium in 40 rabbits. Treatment of these rabbits with Xin-Fu-Ning IV elevated the plasma atrial

natriuretic factor levels indicating that the drug could improve endocrine function of heart and exert a curative effect on CHF.

9205-2982 Loggia, R.D., Sosa, S., Leitner, Z., Isaac, O., Tubaro, A. (Institute of Pharmacology and Pharmacognosy, University of Trieste, Trieste, Italy) **Anti-inflammatory activity of Calendula seed oil, rich in W-6 fatty acids.** *Planta Medica*, v. 57(Supplement 2): p. A49, 1991 (3 ref, Eng).

An oil very rich in W-6 fatty acids was obtained from the seeds of *C.officinalis* to check its antiinflammatory properties by using the Croton oil ear test in mice, in comparison with olive oil that has a low content of W-6(5 percent) fatty acids. After topical application, both *Calendula* seeds oil(CSO) and olive oil exert a dose-dependent anti-edematous effect, but CSO is more active than olive oil (ID₅₀=645 and 1,320 microg/ear, respectively).

9205-2983 Lukic, V., Gasic, O., Walterova, D., Simanek, V., Popovic, M. (Institute of Chemistry, Faculty of Sciences, University of Novi Sad, 2100 Novi Sad, Yugoslavia) **The effect of colchicine congeners on some biochemical parameters in vitro and in vivo.** *Planta Medica*, v. 57(Supplement 2): p. A104, 1991 (3 ref, Eng).

Cornigerine(1) and colchicine(2), isolated from *Colchicum cornigerum* changed slightly the investigated parameters of liver homogenate in vitro, except for the content of reduced glutathione (GSH), which was significantly decreased. The determined parameters in the microsomal fraction had the values in the range of the controls. In vivo, both of these alkaloids decreased significantly the content of GSH in blood and in liver homogenate. These results are in correlation with those obtained in vitro. The activity of glutathione peroxidase was significantly decreased by the action 1 and 2. Besides, these compounds caused a significant increase in lipid peroxidation in vivo.

9205-2984 Ma, L. et al (Second Clinical College, Norman Bethune University of Medical Sciences, Changchun 130041, People's Republic of China) **Experimental study on the immunomodulatory effects of rhubarb.** *Chinese Journal of Integrated Traditional and Western Medicine*, v. 11(7): p. 418-419, 1991 (6 ref, Chi, Eng).

Varying dosages of rhubarb administered orally were able to increase the delayed hypersensitivity response induced by bovine serum albumin and proliferation response of murine spleen cells to Con A and lipopolysaccharide.

9205-2985 Mandal, P.K., Bishayee, A., Mukherjee, J.R., Chatterjee, M. (Division of Biochemistry, Department of

Pharmaceutical Technology, Jadavpur University, Calcutta 700032, WB) **Effect of Mikania cordata root extract on lipid metabolism in carbon tetrachloride induced fatty liver in mice.** *Fitoterapia*, v. 63(2): p. 160-162, 1992 (10 ref, Eng).

The effect of *M.cordata* chloroform root extract was evaluated in mice. Single administration of CCl₄ was used as a model for liver injury. Total lipids in liver, triglyceride content in serum and liver and cholesterol level in serum and its different lipoprotein fractions were used as markers for functional efficiency of the liver cells. Results indicated that the *M.cordata* root extract seemed to show some promising activities in recovering the damage caused in liver tissue by CCl₄.

9205-2986 Mandal, P.K., Bishayee, A., Mukherjee, J.R., Chatterjee, M. (Division of Biochemistry, Department of Pharmaceutical Technology, Jadavpur University, Calcutta 700 032, WB, India) **Mikania cordata root extract in the inhibition of lipid peroxidation and reduction of enzyme leakage in mice with carbon tetrachloride induced liver damage.** *Phytotherapy Research*, v. 6(4): p. 227-229, 1992 (15 ref, Eng).

The effects of *M.cordata* root extract on carbon tetrachloride(CCl₄) induced liver injury were investigated. Lipid peroxidation, serum glutamate oxaloacetate transaminase(SGOT), serum glutamate pyruvate transaminase(SGPT) and serum lactate dehydrogenase(LDH) were used as the marker for functional efficiency of the liver cells. A 7.8 percent inhibition of lipid peroxide levels in liver homogenate was noted at a dose of 10 mg/kg and the inhibition was more prominent(68.7 percent) at the optimum dose level of 150 mg/kg. The inhibitory values were 4.3 percent and 30.4 percent at the low and the high(optimum) doses tested, respectively, in the case of lipid peroxide levels in the hepatic lipid fraction. At a dose of 150 mg/kg, a maximum inhibition of the increased enzyme levels was observed (i.e.SGOT, 15.6 percent; SGPT, 13.4 percent; LDH, 22.8 percent). This observation suggests that *M.cordata* root extract induced a recovery from the damage caused in liver tissue during CCl₄ administration.

9205-2987 Mandal, S., Das, P.C., Joshi, P.C., Chatterjee, A., Islam, C.N., Dutta, M.K., Patra, B.B., Sikdar, S. (Chemical Research Unit, CCRAS, Government of India, Department of Chemistry, University College of Science, 92 Acharya Prafulla Chandra Road, Calcutta 700 009, WB, India) **Antiinflammatory action of Swertia chirata.** *Fitoterapia*, v. 63(2): p. 122-128, 1992 (22 ref, Eng).

Significant antiinflammatory activity has been observed in the total benzene extract of *S.chirata* against acute,

sub-acute and chronic models of inflammation. Subsequent chemical examination of *S.chirata* resulted in the isolation of six xanthone derivatives.

9205-2988 Manfredi, K.P., Blunt, J.W., Cardellina, J.H., McMohan, J.B., Pannell, L.L., Cragg, G.M., Boyd, M.R. (Laboratory of Drug Discovery Research and Development, National Cancer Institute, Frederick, Maryland, 21702-1201, USA) **Novel alkaloids from the tropical plant *Ancistrocladus abbreviatus* inhibit cell killing by HIV-1 and HIV-2.** *Journal of Medicinal Chemistry*, v. 34(12): p. 3402-3405, 1991 (10 ref, Eng).

Organic extracts of aerial parts of *A.abbreviatus* on bioassay-guided fractionation provided the novel atropisomeric pair of anti HIV-cytopathic alkaloids. The alkaloids are michellamine A and B. The antiviral compounds were obtained in three steps. Both the alkaloids inhibited the production of viral reverse transcriptase (antigen) (R1), P24 and SFU (Syncytium-forming units) (antigens) in HIV-infected CEM-SS cells at inhibitory effective concentrations, indicating a diminution of viral replication. Michellamine-B either as free base or HBr salt exhibited the same potency against the cytopathic effects of HIV-2 upon MT-2 target cells in vitro as it did against HIV-1 upon CEM-SS cells. Michellamine-A is some what less effective against HIV-2.

9205-2989 Mazumder, U.K., Gupta, M., Pramanik, G., Mukhopadhyay, R.K., Sarkar, S. (Division of Pharmaceutical Chemistry & Pharmacology, Department of Pharmaceutical Technology, Jadavpur University, Calcutta 700 032, WB, India) **Antifertility activity of seed of *Nelumbo nucifera* in mice.** *Indian Journal of Experimental Biology*, v. 30(6): p. 533-534, 1992 (12 ref, Eng).

Petroleum ether (bp 40-60 degree C) extract of seeds of *N.nucifera*, administered (ip) to sexually mature female albino swiss mice at a dose of 3 mg/kg body weight on alternate days for 15 days after 18 hr of fasting, exhibited significant contraceptive, antiestrogenic and antiprogestational activities.

9205-2990 Mc-Pherson, L. (Division of Nutritional Sciences, N 212, MVR Hall, Cornell University, Ithaca, NY 14853, USA) **Effects of the consumption of fully cooked red kidney beans (*Phaseolus vulgaris*) on the growth rate of rats and the morphology of the gut wall.** *Journal of the Science of Food and Agriculture*, v. 57(4): p. 611-621, 1991 (29 ref, Eng).

Red kidney beans, previously cooked at 100 degree C for 30 min., dried and ground when fed to rats at 100 gm/kg for over 8 weeks along with purified diet. At the end of 8 weeks period, rats were sacrificed, gut wall were examined

histologically, serum was collected and analysed for protein, albumin, globulin, glucose, cholesterol, urea N, creatinine, Ca, P, alkaline phosphatase, aspartate, aminotransferase, alanine, lipase, total bilirubin, Na, K, Cl² and CO₂. Varying amounts of damage were observed in the experimental animals. Serum cholesterol in the experimental animals was also significantly lowered as compared to control animals..

9205-2991 Mills, S. (9 Palace Gate, Exeter EX 11 JA, England) **Are herbs safe ?.** *British Journal of Phytotherapy*, v. 2(2): p. 76-83, 1991 (7 ref, Eng).

Herbs have been claimed to exhibit certain side effect as they may be inappropriate for particular job. A few poisonous plants have been enumerated which are advised to be used with caution in therapeutics. Some case studies of poisoning by herbal remedies, have been mentioned. During pregnancy, medication should be avoided or given with utmost care.

9205-2992 Munoz, A.M., Seifert, H.S.H. (Institute for Pasture Management, University of Nuevoleon, Mexico) **Studies on the toxicity of *L.leucocephala* in goats in North East Mexico.** *Animal Research and Development*, v. 34: p. 42-56, 1991 (24 ref, Eng).

Loss of hair and reduced feed intake were first symptoms of *Leucaena* poisoning followed by increased salivation, vomiting of green material, ataxia of the hind legs, irritability and disturbances of chewing movement.

9205-2993 Nakamura, H., Kumazawa, N., Ohta, S., Fujita, T., Iwasaki, T., Shinoda, M. (Faculty of Pharmaceutical Sciences, Hoshi University, 2-4-41, Ebara, Shinagawa-ku, Tokyo, 142, Japan) **Protective effects of the fractions extracted from the callus of *Acer nikoense* Maxim. on alpha-N-naphthylisothiocyanate induced liver injury.** *Yakugaku Zasshi*, v. 112(2): p. 115-123, 1992 (13 ref, Jap, Eng).

The protective activities of the fractions extracted from the callus of *A.nikoense* were investigated on the alpha-naphthylisothiocyanate (ANIT)-induced liver injuries in rat. The protectively active principles on the ANIT-induced liver injuries were found in the ether soluble fraction. The components of the protective effects were purified by repeated silica gel chromatographies. One of the protective substances in this fraction was identified to be beta-sitosterol. The protective fractions on the ANIT-induced liver injuries showed the protective effects on ANIT-induced cholestasis, but did not show chologogic effects.

9205-2994 Nalini, K., Aroor, A.R., Karanth, K.S., Rao, A. (Department of Clinical Biochemistry and Nutrition, Kasturba Medical College, Manipal 576 119, Karnataka, India) **Effect of *Centella asiatica* fresh leaf aqueous extract on learning and memory and biogenic amine turnover in albino rats.** *Fitoterapia*, v. 63(3): p. 232-237, 1992 (22 ref, Eng).

The effects of the aqueous extract of *C. asiatica* fresh leaves on learning and memory was studied in albino rats using two compartment passive avoidance task. The effect of this extract on the contents of norepinephrine(NE), dopamine(DA), 5-HT in the brain and on the levels of their metabolites both in the brain and urine were also assessed. Significant improvement was observed in the 24 h retention in the drug treated group compared to the saline administered controls. The concentration of NE, DA and 5-HT and their metabolites in the brain were decreased significantly in the drug treated group. The urinary metabolite levels were also significantly decreased except total 3-methoxy-4-hydroxy-phenylglycol(MHPG). These results indicate that *C. asiatica* causes an overall decrease in the turnover of central monoamines, implicating the involvement of NE, DA and 5-HT systems in learning and memory process.

9205-2995 Nishiyama, N., Yuan-Liang, W.* , Saito, H. (Department of Chemical Pharmacology, Faculty of Pharmaceutical Sciences, University of Tokyo, 7-3-1 Hongo, Bunkyo-ku, Tokyo 113, Japan) **Effects of biota (Bai-Zi-Ren), a traditional Chinese medicine, on learning performances in mice.** *Shoyakugaku Zasshi*, v. 46(1): p. 62-70, 1992 (12 ref, Eng).

Biota (*B. orientalis*) showed no influence on the learning abilities in the passive and conditioned avoidance tests in normal mice. In contrast, water (250 mg/kg, p.o.) and ethanol (500 mg/kg, p.o) extracts of biota produced ameliorating effects on the scopolamine-induced memory registration impairment in the step down test. Biota also significantly improved the memory consolidation disability induced by electroconvulsive shock in the step down test. Moreover, a water extract of biota (250 mg/kg, p.o) ameliorated the memory retrieval impairment induced by ethanol in the step down test. These results suggest that biota ameliorates the impaired learning performance through its effects on memory registration, consolidation and retrieval.

9205-2996 Onwukaeme, D.N., Lot, T.Y. (Department of Pharmacognosy, Faculty of Pharmaceutical Sciences, University of Jos, P M B 2084, Jos. Plateau State, Nigeria) **The effects of *Baphia nitida* Lodd (Leguminosae) extract on the gastrointestinal tract of rats and mice.** *Phytotherapy Research*, v. 6(3): p. 129-132, 1992 (20 ref, Eng).

The constituents from the leaves of *B. nitida* were extracted using methanol and acetone as solvents. The extract did not demonstrate any acute toxic effects in mice within the dose range used during this study. The extract inhibited gastric emptying time in rats and intestinal motility in mice, both effects were manifested in a dose-related fashion. These effects were similar but less pronounced than those produced by atropine sulphate. The extract did not induce gastric ulceration in rats and failed to protect against acetyl salicylic acid-induced gastric ulcer in rats or histamine-induced duodenal ulcer in guinea-pigs.

9205-2997 Onyango, J., Addae-Mensah, I. , Muriuki, G. (Kenya Trypanosomiasis Research Institute, Nairobi, Kenya) **Trypanocidal activity of a selection of naturally occurring compounds.** *Planta Medica*, v. 57(Supplement 2): p. A44-A45, 1991 (1 ref, Eng).

Five pure compounds isolated from various plants were tested. These were crotepoixide from *Croton macrostachyus*, 9-methoxychelerythrine from *Zanthoxylum chalybeum* and its chloride derivative, rutin from *Bridelia ferruginea*, and dihydrowisanine from *Piper guineense*. At 80 mg/kg, 9-methoxychelerythrine chloride proved lethal to the mice, while its free base had no significant effect on parasitaemia. Crotepoixide, rutin and dihydrowisanine suppressed parasitaemia to some extent but did not clear the parasites. The suppression lasted 3 days for dihydrowisanine, 4 days for crotepoixide, and 15 days for rutin. These compounds were then tested again at 100 mg/kg. At this dose, rutin suppressed parasitaemia for 10-15 days, while the number of days by crotepoixide rose from 4 to 9 days. These results indicate that both rutin and crotepoixide have some trypanocidal activity when administered as a single dose.

9205-2998 Pieters, L., Yang, Q.R., Claeys, M. , Vanden Berghe, D., Vlietinck, A. (Department of Pharmaceutical Sciences and Microbiology, University of Antwerp, B-2610 Antwerp, Belgium) **Biological activities of 3',4-O-dimethylcedrusin and taspine: Two constituents from *Sangre de Drago*.** *Planta Medica*, v. 57(Supplement 2): p. A12-A13, 1991 (2 ref, Eng).

Sangre de Drago (dragon's blood), is a blood-red latex, produced by various South American *Croton* sp., including *C. lechleri*, *C. draconoides* (or *C. palanostigma*), and *C. erythrochilus*. An in vitro test system was used for stimulation of endothelial cells obtained from a human umbilical cord vein for the bioassay-guided fractionation of Sangre de Drago which showed that the diethyl extract stimulated endothelial cells (process of wound healing) and this activity was due to a dihydrobenzofuranolignan 3',4-O-dimethylcedrusin. Taspine did not show any activity.

9205-2999 Pifferi, G. (Research and Development Laboratories, Inverni della Beffa SpA, 1-20141 Milano, Italy) **Silipide: a new bioavailable complex of silybin.** *Planta Medica*, v. 57(Supplement 2): p. A12, 1991 (6 ref, Eng).

Compared with silybin, (flavanolignan of *Silybum marianum*, orally administered Silipide shows higher pharmacological activity in animal models of hepatic injury such as the liver damage induced by phalloidin (protection against mortality, ED₅₀=279 mg/kg) and by praseodymium in rodents. Unlike silybin, Silipide given orally is effective in decreasing by about 40 percent microsomal lipid peroxidation induced by NADPH, CCl₄, and CuOOH in rats (an effect which is probably due to a scavenging action against lipid derived free radicals). Pharmacokinetic studies conducted in healthy volunteers and in patients with hepatic cirrhosis demonstrated that the oral bioavailability of Silipide is much greater than that of silybin administered as a component of silymarin. Biliary recovery studies in cholecystectomized patients with T-tube drainage confirmed that intake of Silipide ensures a greater delivery of the active principle to the target organ.

9205-3000 Polasa, K., Sesikaran, B., Krishnaswamy, K. (National Institute of Nutrition, Hyderabad, AP, India) **Antimutagenicity of turmeric (*Curcuma longa*).** *Proceedings of the Nutrition Society of India*, v. 36 p. 102, 1990 (Recd. 1992, Eng).

Rats were fed with turmeric incorporated into diet at various levels and exposed to benz (alpha)-pyrene (BP), a known carcinogen. The urinary mutagens were detected using the Salmonella typhimurium assay. Turmeric fed at 0.5 percent, 1.0 percent, 5.0 percent and 10.0 percent inhibited BP mediated mutagenicity in bacteria indicating that turmeric has antimutagenic activity. It did not produce any side effects in terms of food intake, weight gain or histological changes in these rats. Turmeric, can be regarded as chemoprotective agents. The study has also brought out a useful in vivo model for testing the antimutagenic effect of other commonly used minor dietary constituents. NSL, New Delhi.

9205-3001 Prabhakar, E., Nanda Kumar, N.V. (Division of Environmental Biology, Department of Zoology, Sri Venkateswara University, Tirupati 517 502, TN, India) **Potentiating action of *Datura metel* Linn. root extract on rat intestinal cholinesterase.** *Phytotherapy Research*, v. 6(3): p. 160-162, 1992 (14 ref, Eng).

D. metel leaf extract which is known to contain a tropane alkaloid, scopolamine, was found to inhibit rat intestinal cholinesterase in vitro. The inhibition could not be reversed with higher concentrations of cholinesterase

substrate. Whereas *D. metel* root extract was found to activate cholinesterase enzyme activity at optimal or higher substrate concentrations. With root and leaf extract together, the cholinesterase activity level at higher concentrations of substrate, was elevated compared with the inhibitory effect of *Datura* leaf extract alone, suggesting a potentiating action of *Datura* root extract on cholinesterase.

9205-3002 Qian, J., Hunkler, D., Safayhi, H., Rimpler, H. (Institute for Pharmaceutical Biology, Freiburg University, D-7800 Freiburg, FRG) **New iridoid-related constituents and the anti-inflammatory activity of *Scrophularia ningpoensis*.** *Planta Medica*, v. 57(Supplement 2): p. A56, 1991 (6 ref, Eng).

The antiinflammatory activity of the hydrophilic extract of Radix *Scrophulariae* was tested on the model of carrageenin-induced rat paw edema. Compared with the standard drug indomethacin (10 mg/kg, p.o.), the hydrophilic extract, in the doses of 500, 100 and 20 mg/kg p.o. showed a significant inhibitory effect on this animal model. And the ED₅₀ was about 20 mg/kg. From the hydrophilic extract two new iridoid-related glycosides as well as two known iridoids, aucubin and 6-O-methylcatalpol, were isolated. The known compounds were identified by comparison with authentic samples and published data. The structures of the iridoid-related aglucone and the two glycosides of this aglucone were established by mass spectrometry, ¹H-NMR and ¹³C-NMR spectroscopy, including 2D-homo, 2D-hetero NMR, and NOE techniques and by chemical methods.

9205-3003 Qiao, Z.S., Wu, H., Su, Z.W. (College of Pharmacy, Second Military Medical University, Shanghai 200433, People's Republic of China) **Comparison of the pharmacological actions of *Morinda officinalis*, *Damnanthus officinarum*, and *Schisandra propinata*.** *Chinese Journal of Integrated Traditional and Western Medicine*, v. 11(7): p. 415-417, 1991 (12 ref, Chi, Eng).

The body weight, the thymus weight, the amount of leukocyte in the blood, and the continuing swimming times of the young mice could be increased with the administration of the water extracts of the root of *M. officinalis* and *D. officinarum* (2) (P less than 0.05-0.001). The Rt of M-receptor in the brains of the hypothyroidism mice were decreased after administration of the water extracts of (1) and (2) (P less than 0.05). *M. officinalis* could also increase the amount of leukocyte in the blood of leukocytopenia mice caused by radiation of gamma rays. *S. propinqua* did not exhibit any activity. The results indicate that *M. officinalis* and *D. officinarum* have ability of anti-fatigue, improving the immunological action of the young mice and reducing the excitability of the para-sympathetic nervous system of the hypothyroidism mice through decreasing the Rt of M-

receptor. No toxicity or sexual hormone like actions were observed.

9205-3004 Quetin-Leclercq, J., Elias, R., Balansard, G., Bassleer, R., Angenot, L. (Laboratoire de Pharmacognosie, Institut de Pharmacie, Université de Liège, rue Fusch, 5, B-4000 Liège, Belgium) **Cytotoxic activity of some triterpenoid saponins.** *Planta Medica*, v. 58(3): p. 279-281, 1992 (12 ref, Eng).

The cytotoxic activity of saponins isolated from plants (*Calendula arvensis*, *C.officinalis*, *Sapindus mukurossi* and *Hedera helix*) has been examined with a view to determine the possible structure activity relationships. Study of the cytotoxicity of was carried out on four cell strains: mouse B16 melanoma cells, mouse 3T3 non cancer fibroblasts, Flow 2002 non-cancer human cells, and human HeLa tumour cells. Results showed that the 16 saponins tested were at least five times less active than the reference compound strychnopentamine and that none of them seems to have any specific action on cancer cells. Only monodesmosides showed some cytotoxicity at concentrations of 10 microg/ml and above.

9205-3005 Rao, G.S., Sivaramakrishnaiah, K., Ravi Kumar, P.R. (Department of Pharmacology and Toxicology, College of Veterinary Science, Tirupati 517502, AP, India) **Pharmacological action of Cleistanthus collinus Rox 'B' a toxic plant.** *Indian Veterinary Journal*, v. 69(6): p. 501-504, 1992 (7 ref, Eng).

Aqueous extract of leaves of *C.collinus* was screened for pharmacological action. It produced a fall in blood pressure and decreased pulse pressure in anaesthetized dogs. It produced myocardial depression in isolated amphibian heart and caused vascular constriction. It produced contractions in the rat uterus in tachycardial manner. The myocardial depressant effect could not be blocked by atropine, adrenaline or calcium..

9205-3006 Rashan, L.J., Adday, M.H., Jirjes, R.K. (Department of Biology, College of Education, University of Mosul, Mosul, Iraq) **Pharmacological activity of the aqueous extracts of leaves, stems and seeds of Aristolochia bottae.** *Fitoterapia*, v. 63(2): p. 184-185, 1992 (7 ref, Eng).

The crude aqueous extracts of leaves, stems and seeds of *A.bottae* given i.p. showed as CNS depressant activity in mice. When tested for antiinflammatory activity, the leaf and stem extracts showed a significant antiinflammatory activity in rats.

9205-3007 Rauwald, H.W., Brehm, O. (Institut für Pharmazeutische Biologie, Johann Wolfgang

Goethe-Universität Frankfurt, Georg Voigt Strasse 16, D-6000 Frankfurt/M 11, Federal Republic of Germany) **Screening of some medicinal plants for their possible calcium-antagonistic activity.** *Planta Medica*, v. 57(Supplement 2): p. A59-A60, 1991 (4 ref, Eng).

No calcium antagonistic activity was noticed in the extracts of *Solidago gigantea* and *Leonurus cardiaca* but *Peucedanum ostruthium*, *Ammi visnaga* and *Ruta graveolens* showed a significant calcium inhibition. Active constituents were isolated from these plants. From *P.ostruthium* six crystalline coumarins were isolated and each showed a strong activity at a concentration of 0.00001g/ml. Imperatorin was found to be one of the three most active compounds.

9205-3008 Recio, M.C., Giner, R., Terencio, M.C., Sanz, M.J., Rios, J.L. (Departamento de Farmacología, Facultad de Farmacia, Universidad de Valencia, Valencia, Spain) **Antiinflammatory activity of Helichrysum stoechas.** *Planta Medica*, v. 57(Supplement 2): p. A56-A57, 1991 (7 ref, Eng).

The aerial parts of *H.stoechas* yielded three compounds which were identified as 4-hydroxy-3-(isopenten-2-yl)-acetophenone, gnaphaliin (5,7-dihydroxy-3,8-dimethoxyflavone) and ursolic acid. The three compounds showed antiinflammatory activity at a dose of 1 mg/ear in the tetradecanoylphorbol acetate (TPA)-induced mouse ear edema test. All three compounds have showed a notable topical antiinflammatory activity in spite of their completely different chemical structures.

9205-3009 Reher, G., Slijepcevic, M., Kraus, Lj. (Lehrstuhl für Pharmakognosie der Universität Hamburg, Bundesstrasse 43, D-2000, Hamburg 13, Federal Republic of Germany) **Hypoglycemic activity of triterpenes and tannins from Sarcopoterium spinosum and two Sanguisorba species.** *Planta Medica*, v. 57(Supplement 2): p. A57-A58, 1991 (4 ref, Eng).

Three triterpenes were tested: 23-hydroxytormentonic acid ester glucoside and 23-hydroxytormentonic acid have been isolated from the root bark of *S.spinosum* and also from the root bark and the aerial parts of *Sanguisorba minor*. (3-O-L-arabinopyranosylpomolic acid ester glucoside) (3) has been isolated from the root bark and the aerial parts of *S.officinalis*, but was absent in *Sarcopoterium* and *Sanguisorba minor*. For the pharmacological test three different tannin extracts were prepared: a fraction consisting of only polymers as well as a fraction of di-, tri, and oligomerproanthocyanidins and (+)-catechin have not shown any activity. The fraction 5-6, however, a combination of tannins and triterpenes (ca.95:5), lowered the blood sugar level statistically significant in a concentration of 300 mg/kg.

9205-3010 Sakamoto, T., Mitani, Y., Nakajima, K. (New Product Division, Rohto Pharmaceutical Co., Ltd., 8-1, Tatsumi-nishi, 1-Chome, Ikuno-ku, Osaka 544, Japan) **Psychotropic effects of Japanese valerian root extract.** *Chemical & Pharmaceutical Bulletin*, v. 40(3): p. 758-761, 1992 (9 ref, Eng).

The psychotropic effects of "Hokkai-Kisso", i.e. roots of Japanese valerian (*Valeriana* genus) were compared with those of diazepam and imipramine. Both 30 percent EtOH extract of valerian root (11.2g/kg) and diazepam (3 mg/kg) significantly prolonged hexobarbital-induced sleep in mice. Spontaneous ambulation and rearing during an open field test were significantly decreased by valerian extract (11.2g/kg). Diazepam (10 mg/kg) significantly decreased approach-avoidance conflict in mice in a water-lick conflict test, but valerian extract and KGD did not. Valerian extract (4.1 g/kg) and imipramine (20 mg/kg) significantly inhibited immobility induced by a forced swimming test in rats, but did not increase spontaneous motor activity during an open field test just before the forced swimming test. Valerian extract and imipramine significantly reversed reserpine-induced hypothermia in mice. These results indicate that valerian extract acts on the CNS and may be in antidepressant..

9205-3011 Sakanaka, S., Shimura, N., Aizawa, M., Kim, M. (Central Research Laboratories of Taiya Kagaku Co. Ltd., 1-3 Takaramachi, Yokkaichi-shi, Mie 510, Japan) **Preventive effect of green tea polyphenols against dental caries in conventional rats.** *Bioscience, Biotechnology and Biochemistry*, v. 56(4): p. 592-594, 1992 (15 ref, Eng).

Effects of green tea polyphenols, inhibitors of various biological activities of cariogenic bacteria in vitro, on caries development were examined using rats. Test animals were given tea polyphenols ranging from 0.1 to 0.5 percent in their cariogenic diet for 40 days. Total fissure caries were significantly reduced by the addition of polyphenols. No toxic effects on rats were observed..

9205-3012 Sato, T., Kawamoto, A., Tamura, A., Tatsumi, Y., Fujii, T. (Department of Biochemistry, Kyoto Pharmaceutical University, Yamashima-ku, Kyoto 607, Japan) **Mechanism of antioxidant action of Pueraria glycoside (PG)-1 (an isoflavonoid) and mangiferin (a xanthonoid).** *Chemical & Pharmaceutical Bulletin*, v. 40(3): p. 721-724, 1992 (24 ref, Eng).

The antioxidant activities of pueraria glycoside (PG)-1 (isoflavonoid obtained from *Pueraria lobata*) and mangiferin (xanthonoid from *Anemarrhena asphodeloides* roots), were studied and compared with PG-3 and daidzein (isoflavonoids) and with wogonin (flavonoid from *Scutellaria baicalensis*). PG-1 and mangiferin rapidly scavenged

1,1-diphenyl-2-picrylhydrazyl (DPPH) radical, and inhibited lipid peroxidation which was initiated enzymatically in rat liver microsomes. Wogonin inhibited the enzymatically induced lipid peroxidation but had no scavenging effect on DPPH radical or on the non-enzymatic peroxidation. PG-3 and daidzein did not show any of these effects. Formation of Fe²⁺ by NADPH-dependent cytochrome P-450 reductase was inhibited by wogonin, but not by PG-1 or mangiferin. PG-1 and mangiferin had no effect on terminating radical chain reaction during the lipid peroxidation. These results suggest that PG-1 and mangiferin have an antioxidant activity, probably due to their ability to scavenge free radicals involved in initiation of lipid peroxidation. In contrast, wogonin may affect NADPH-dependent cytochrome P-450 reductase action, since it inhibited only the enzymatically induced lipid peroxidation..

9205-3013 Schmeda-Hirschmann, G., Loyola, J.I., Sierra, J., Retamal, R., Rodriguez, J. (Departamento de Biología, Universidad de Talca, Casilla 747, Talca, Chile) **Hypotensive effect and enzyme inhibition activity of Mapuche medicinal plant extracts.** *Phytotherapy Research*, v. 6(4): p. 184-188, 1992 (13 ref, Eng).

Thirty-five plant samples belonging to 30 Mapuche medicinal plants were assayed for xanthine oxidase and beta-glucuronidase inhibitory activity as well as for brine shrimp toxicity and hypotensive effect in normotensive rats. A high number of extracts displayed significant inhibition towards the enzyme beta-glucuronidase or elicited a hypotensive response. The biological activity of the assayed extracts shows some correlation with their use as digestives for treating hepatic troubles by the Mapuche Amerindians. From the ten plants displaying a hypotensive effect 20 percent, eight have some ethnobotanical indication suggesting that activity.

9205-3014 Schneider, E., Holzl, J., Eckes, B., Mauch, C., Schirren, C.G. (Institut für Pharmazeutische Biologie der Philipps-Universität, Deutschhausstr. 17 1/2, D-3550 Marburg, Federal Republic of Germany) **Effects of carotenoids extracted from *Calendula officinalis* on proliferation and chemotaxis of human fibroblasts and on contraction of collagen lattices by fibroblasts.** *Planta Medica*, v. 57(Supplement 2): p. A60, 1991 (4 ref, Eng).

Four carotenoid fractions (F1-F4) were isolated from the dried flowers of *C. officinalis*. Cultures of human foreskin fibroblasts were incubated with the carotenoid samples in concentrations ranging from 25 microg/ml to 0.000005 microg/ml. Proliferation was assayed over 6-13 days in the presence of 0.5 percent or 10 percent fetal calf serum (FCS). Incubation time prior to chemotaxis and contraction of collagen gels was 24 to 48 hours. F1 and F3 caused growth

cessation and cell loss at 25microg/ml, however the inhibition due to F3 was less pronounced. The LD50 value ranged between 12.5 and 17.5 microg/ml for F1 and between 18 and 25 microg/ml for F3. The inhibitory effect was markedly reduced in the presence of 10 percent FCS. The contraction of collagen gels was not significantly influenced, though a concentration-dependent tendency to increase gel contraction was observed, except for F4. No chemotactic activity could be seen, nor did the tested fractions significantly alter the response of fibroblasts towards a chemoattractant.

9205-3015 Scholz, D., Eigner, D. (Sandoz Forschungsinstitut, Brunnerstr. 59, A-1235 Wien, Austria) **Medicinal plants and magic cures: The notebook of a Tamang healer in Nepal.** *Planta Medica*, v. 57 (Supplement 2): p. A60-A61, 1991 (5 ref, Eng).

The notebook of a deceased Tamang shaman from the eastern hills in Nepal was received during a field trip in 1986. This booklet, which is allegedly only a partial copy of the original, was in possession of his daughter. After his death she had started to practise as a shaman in the Kathmandu Valley, using the knowledge transmitted to her by her father's spirit. The notebook consists of thirty-five magic formulae and sixteen prescriptions based mainly on plant material. Some of the plants *Picrorhiza kurrooa*, *Zanthoxylum armatum*, *Curcuma longa* and *Orchis incarnata* reported in the booklet were tested for anti-HIV, antimycotic, antiinflammatory activity etc. but no significant results were observed.

9205-3016 Sen, T., Nag Chaudhuri, A.K. (Division of Pharmacology, Department of Pharmaceutical Technology, Jadavpur University, Calcutta 700 032, WB, India) **Studies on the neuropharmacological aspects of *Pluchea indica* root extract.** *Phytotherapy Research*, v. 6(4): p. 175-179, 1992 (19 ref, Eng).

Neuropharmacological studies were conducted in rodents with *P.indica* root extract. On investigation with different experimental models it was found that the extract produced alteration of behaviour pattern, reduction in spontaneous motility, prolongation of pentobarbitone-induced sleep, suppression of aggressive behaviour pattern and of the conditioned avoidance response. The observations suggest that the root extract of *P.indica* possesses a potent central nervous system depressant action.

9205-3017 Sheela, C.G., Augusti, K.T. (Department of Biochemistry, University of Kerala, Kariavattom, Thiruvananthapuram 695581, Kerala, India) **Antidiabetic effects of S-allyl cysteine sulfoxide isolated from garlic (*Allium sativum*) Linn..** *Indian Journal of Experimental Biology*, v. 30(6): p. 523-526, 1992 (26 ref, Eng).

5-Allyl cysteine sulfoxide exhibited significant antidiabetic activity in alloxan diabetic rats. At a dose of 200 mg/kg body weight it decreased significantly the concentration of serum lipids, blood glucose and activities of serum enzymes like alkaline phosphatase, acid phosphatase, lactate dehydrogenase and liver glucose-6-phosphatase. Liver and intestinal HMG CoA reductase activity and liver hexokinase activity were increased significantly.

9205-3018 Shukla, V.J., Makwana, H.G., Dave, L.N., Dave, K.K., Dodia, U.A., Sharma, J.M., De, S., Ravishankar, B. (Pharmacology Laboratory, Dravyagun Department, IPGT & R, Jamnagar 361 008, Gujarat, India) **Studies on *Hibiscus rosa sinensis* flower - Elucidation of mechanism of action of the efficacy in dysfunctional uterine bleeding.** *Ayu*, v. 12(5): p. 13-22, 1991 (7 ref, Eng).

Aqueous infusion of flowers reduced the duration of oestrus cycle in experimental albino rabbits, but did not show any effect on isolated tissue preparations.

9205-3019 Singh, G.K., Dixit, V.K. (Department of Pharmaceutical Sciences, Dr. H.S. Gour Vishwavidyalaya, Sagar 470003, MP, India) **Antihepatotoxic activity of *Trianthema portulacastrum*.** *Indian Journal of Natural Products*, v. 7(2): p. 3-8, 1991 (8 ref, Eng).

The ethanolic extract of aerial parts of *T.portulacastrum* exhibited hepatoprotective activity against carbon tetrachloride intoxication in rats. Acetone insoluble fraction of the extract was found to be responsible for hepatoprotective action. The activity was evaluated using biochemical and histopathological parameters.

9205-3020 Singhal, K.C., Sharma, S., Mehta, B.K.* (School of Studies in Chemistry, Vikram University, Ujjain 456006, MP, India) **Antifilarial activity of *Centratherum anthelminticum* seed extracts on *Setaria cervi*.** *Indian Journal of Experimental Biology*, v. 30(6): p. 546-548, 1992 (10 ref, Eng).

Ethylacetate, acetone and methanol extracts of seeds of *C.anthelminticum* showed similar effect, of causing inhibition of spontaneous motility of the nerve-muscle preparation of *S.cervi* characterized by decreased amplitude and frequency of contractions. The inhibitory effect on the motility was reversible. The extracts did not involve the blockade of cholinergic receptors.

9205-3021 Sklenovsky, A., Navratil, J., Chmela, Z., Kreja, Z., Hanus, L. (Department of Pathological Physiology, Medical Faculty of the Palacky University, ul. Dr S. Allende 3, 775 15 Olomouc, Czechoslovakia) **Effect of delta-9-tetrahydrocannabinol (delta-9-THC) on the release of nonesterified fatty acids in various brain structures.**

Acta Universitatis Palackianae Olomucensis (Olomouc), Facultatis Medicae, v. 122: p. 71-82, 1989 (16 ref, Eng, Cze).

After administration of delta-9-THC (10 mg/kg per os for two days) to rats, the levels of nonesterified fatty acids (NEFA) decreased in the brain cortex, the brain stem and most in the hypothalamus. This NEFA decrease is in harmony with the functional inhibition of CNS provoked by delta-9-THC.

9205-3022 Stuppner, H., Dorsch, W., Wagner, H., Gropp, M., Kepler, P. (Institut für Pharmakognosie, Universität Innsbruck, A-6020 Innsbruck, Austria) **Antiasthmatic effects of Picrorhiza kurroa: Inhibition of allergen- and PAF-induced bronchial obstruction in Guinea pigs by androsin, apocynine, and structurally related compounds.** *Planta Medica*, v. 57(Supplement 2): p. A60, 1991 (2 ref, Eng).

Androsin was also effective when given as aerosol (0.6 mg.). Apocynine, the aglycone of androsin, exhibited similar or even higher protective effects (10 mg/kg orally, 0.3 mg topically). By chemical modification of androsin and its aglycone, a further improvement of the pharmacologic activity was achieved. 4-Hydroxy-3,5-dimethoxyacetophenone beta-D-glucopyranoside reduced markedly the PAF-induced asthmatic reactions (10 mg/kg orally, 0.5 mg topically). The same dose of 2,4-dimethoxy-3-hydroxyacetophenone, prevented totally the allergen- and PAF-induced bronchial obstruction.

9205-3023 Sun, X.Z. (Department of Immunology, Beijing Medical University, Beijing 100083, China) **Experimental study on the immunosuppressive effects of Qinghaosu and its derivatives.** *Chinese Journal of Integrated Traditional and Western Medicine*, v. 11(1): p. 37-38, 1991 (9 ref, Chi, Eng).

Successive administration qinghaosu (QHS) and its derivative (DQHS) at the dose level of 25-00 mg/kg the amounts of anti-SRBC Ig of PFC and Ig G PFC in the murine spleen were decreased significantly. At the dose level of 100 mg/kg the QHS and DQHS were able to inhibit the DTH induced by BSA. These results suggest the suppressive effects of QHS and DQHS on both humoral and cellular immunities of mice. Significant reduction of interleukin-2 (IL-2) production of murine spleen cells has been reported.

9205-3024 Sutarjadi, Santosa, M.H., Bendryman, Dyatmiko, W. (Center for Research and Development of Traditional Medicines, Airlangga University, Surabaya, Indonesia) **Immunomodulatory activity of Piper betle, Zingiber aromatica, Andrographis paniculata, Allium sativum, and Oldenlandia corymbosa grown in In-**

donesia. *Planta Medica*, v. 57(Supplement 2): p. A136, 1991 (3 ref, Eng).

Water soluble extracts of *P. betle* leaves, *Z. aromaticum* rhizome, *A. paniculata* herb, *A. sativum* bulbs and *O. corymbosa* leaves given to mice intraperitoneally and orally caused humoral immune response stimulation and cellular immune response suppression.

9205-3025 Tachibana, Y., Kawanishi, K. (Kobe Women's College of Pharmacy, 4-19-1, Motoyamakita-machi, Higashinada-ku, Kobe 658, Japan) **Mitogenic activities in the protein fractions of crude drugs.** *Planta Medica*, v. 58(3): p. 250-254, 1992 (18 ref, Eng).

Eighteen different crude drugs were extracted with hot water and saline, and protein fractions were prepared from the extracts by ammonium sulfate precipitation. Mitogenic activities of the protein fractions were examined both on human peripheral blood lymphocytes and on mouse spleen cells. Potent mitogenic activities for both human and/or mouse lymphocytes were found in the protein fractions of four crude drugs, namely, Bupleuri radix, Pinelliae tuber, Sophorae radix, and Zedoariae rhizoma. Target specificities of these mitogens were investigated by using isolated T and B cells and lymphocytes from athymic nude mice. Sensitivity to protease digestion as well as water-soluble, ammonium sulfate precipitable nature assures that the substances responsible for the mitogenic activities are proteins.

9205-3026 Tian, J., Chen, X.M., Li, L.S. (Department of Nephrology, Beijing 301 Hospital, Beijing 100853, China) **Effects of Cordyceps sinensis, rhubarb and serum renotropin on tubular epithelial cells growth.** *Chinese Journal of Integrated Traditional and Western Medicine*, v. 11(9): p. 547-549, 1991 (10 ref, Eng).

Primary cultured rat tubular epithelium was utilized to investigate the effect of *C. sinensis* (CS) on cellular proliferation and metabolism. It was found that the addition of serum containing CS metabolites into the culture media could promote the DNA synthesis of tubular cells profoundly. In association with its beneficial effects on gentamycin nephrotoxicity in vivo study, it is indicated that CS could enhance the regeneration of injured tubular cells. In addition, sera obtained from 5/6 nephrectomized rats (5/6 NT) and rhubarb treated rats were studied to see their effects on tubular cells growth. The results showed that the serum of 5/6 NT rats could promote the DNA synthesis of tubular epithelium, while the presence of experimental serum of rhubarb in culture medium markedly inhibited the DNA synthesis of cells.

9205-3027 Tortoriello, J., Lozoya, X. (Traditional Medicine and Drug Development Research Unit, Mexican Institute of Social Security, IMSS, Xochitepec, CP 6790, Mexico) **Effect of Galphimia glauca methanolic extract on neuropharmacological tests.** *Planta Medica*, v. 58(3): p. 234-236, 1992 (8 ref, Eng).

A methanolic extract from its aerial parts of *G. glauca* was tested in several neuropharmacological animal models including among others: hypothermic activity, barbiturate potentiation, protection against strychnine- and leptazol-induced convulsions. The combined data obtained from all biological models demonstrate the sedative property of this plant product.

9205-3028 Tseng, C.F., Iwakami, S., Mikajiri, A., Shibuya, M., Hanaoka, F., Ebizuka, Y., Padmawinata, K., Sankawa, U. (Faculty of Pharmaceutical Sciences, The University of Tokyo, 7-3-1, Hongo, Bunkyo-ku, Tokyo 113, Japan) **Inhibition of in vitro prostaglandin and leukotriene biosyntheses by cinnamoyl-beta-phenethylamine and N-acetyldopamine derivatives.** *Chemical & Pharmaceutical Bulletin*, v. 40(2): p. 396-400, 1992 (10 ref, Eng).

N-trans- and N-cis-Feruloyltyramines were isolated as the inhibitors of in vitro prostaglandin (PG) synthesis from an Indonesian medicinal plant, *Ipomoea aquatica*. In order to clarify structure activity relationships, cinnamoyl-beta-phenethylamines with possible combinations of naturally occurring cinnamic acids and beta-phenethylamines were synthesized and tested for their inhibitory activities against PG synthetase and arachidonate 5-lipoxygenase. The compounds containing catechol groups such as N-caffeoyl-beta-phenethylamine (CaP) showed higher inhibitory effects on PG synthetase. The catechol group was found to be essential for the inhibition of arachidonate 5-lipoxygenase. N-Linoleoyldopamine was the most active compound and its IC₅₀ value was 2.3 nM in the assay system, in which an IC₅₀ value of AA 861, a specific inhibitor of 5-lipoxygenase, was 8 nM.

9205-3029 Uma Devi, P., Sharda, A.C., Solomon, F.E., Kamath, M.S. (Department of Radiobiology, Kasturba Medical College, Manipal 5776119, Karnataka, India) **In vivo growth inhibitory effect of Withania somnifera (Ashwagandha) on a transplantable mouse tumor, Sarcoma 180.** *Indian Journal of Experimental Biology*, v. 30(3): p. 169-172, 1992 (17 ref, Eng).

Alcoholic extract of the root of *W. somnifera* was injected at daily doses of 200 to 1000 mg/kg body wt for 15 days. Solid tumor growth was monitored for 100 days. Doses of 400 mg/kg and above produced complete regression of tumor after an initial growth, and percentage of complete response (CR) increasing with increasing drug

dose. A 55 percent CR was obtained at 1000 mg/kg drug administration, but this dose also produced some mortality among the animals. A significant increase in the volume doubling time and growth delay was seen when the drug dose was increased from 500 to 750 mg/kg body wt, but further increase in drug dose to 1000 mg/kg did not produce any significant increase in these responses. Cumulative doses of 7.5 to 10 g at daily doses of 500 or 700 mg/kg was found to produce a good response in this tumor.

9205-3030 Umehara, K., Takagi, R., Kuroyanagi, M., Ueno, A., Taki, T., Chen, Y.J. (School of Pharmaceutical Sciences, University of Shizuoka, 395 Yada, Shizuoka 422, Japan) **Studies on differentiation-inducing activities of triterpenes.** *Chemical & Pharmaceutical Bulletin*, v. 40(2): p. 401-405, 1992 (14 ref, Eng).

Differentiation-inducing activity (anticancer agents) of over 180 extracts of crude drugs and plants was tested using mouse myeloid leukemia cell line (M1). The methanol extracts of clove (*Syzygium aromaticum*) showed remarkable induction of differentiation of M1 cells into macrophage-like cells. From the extract, oleanolic acid and crategolic acid were isolated as the active components. Other triterpenes, such as oleananes, ursanes and dammaranes were also tested to investigate the structure-activity relationship. Some triterpene aglycones showed differentiation-inducing activity, but triterpene glycosides showed little activity. Furthermore, the differentiation-inducing activity of these triterpene compounds was tested against human acute promyelocytic leukemia cell line (HL-60).

9205-3031 van den Dungen, F.M., van den Berg, A.J.J., Beukelman, C.J., Quarles van Ufford, H.C., van Dijk, H., Labadie, R.P. (Research Centre for Natural Products and Phytopharmaceuticals, University of Utrecht, Faculty of Pharmacy, Department of Pharmacognosy, PO Box 80082, 3508 TB Utrecht, The Netherlands) **Inhibition of complement activity by high molecular compounds of Symphytum officinale.** *Planta Medica*, v. 57(Supplement 2): p. A62-A63, 1991 (13 ref, Eng).

Ethanol (30 percent) extract of *Symphytum* roots was centrifuged and fractionated by ultrafiltration. The fractionation was guided by the inhibition of classical pathway activation. The activity was found to reside in the fraction with a molecular mass greater than 300 kD. An acid hydrolysate of the fraction showed ninhydrin and raphthoresorcinol positive spots on TLC, pointing to the presence of amino acids sugars. During immuno-mechanistic studies it was found that complement factors C3 and C4 were inhibited by the less than 300 kD fraction in a dose dependent manner, whereas C1 and C2 were not affected.

9205-3032 Vhen, W.M., Zhang, P.L., Wu, B., Zheng, Q.T. (Institute of Materia Medica, Chinese Academy of Medical Sciences, Beijing 100 050, China) **Studies on the chemical constituents of *Taxus yunnanensis*.** *Acta Pharmaceutica Sinica*, v. 26(10): p. 747-754, 1991 (9 ref, Chi, Eng).

The ethanolic extract of the bark of *T.yunnanensis* showed significant antineoplastic effect on the transplantable tumors in mice. The life survival of P388 leukemic bearing mice was increased (84 percent) and the growth of B16 melanoma in mice was inhibited (53 percent). From this extract eight known taxane diterpenoids and taxane alkaloids have been isolated. A new taxane diterpenoid, named yunnanxane was elucidated as taxa-4(20), 11-diene-2alpha,5alpha, 10beta, 14beta-tetraoln 2alpha,5alpha,10beta-triacetate-14beta-alpha-methyl-beta-hydroxylbuty rate by highfied 1H NMR, 13C NMR, 1H-1HCOSY, 13-1HCOSY, 13C-1HCOLOC and X-ray analysis. It showed the inhibitory effect on A2780 DDP, KB and HCT-8 cell line in vitro. All of the eight compounds were isolated from this species for the first time.

9205-3033 Vohora, S.B., Dandiya, P.C. (Jamia Hamdard (Hamdard University), Hamdard Nagar, New Delhi 110 062, India) **Herbal analgesic drugs.** *Fitoterapia*, v. 63(2): p. 195-207, 1992 (109 ref, Eng).

The paper embodies a global review on herbal analgesics with special emphasis on those of Indian origin. Studies on purified principles, clinical aspects, mechanism of action and structure activity relationship are relatively few and warrant further attention. From authors' researches 8 plants: *Azadirachta indica*, *Centella asiatica*, *Melia azedarach*, *Nardostachys jatamansi*, *Nigella sativa*, *Ocimum sanctum*, *Valeriana wallichii* and *Withania somnifera* revealed promising narcotic analgesic activity (mediated through opioidergic receptors) while 4 plants: *Corchorus depressus*, *Solanum melongena*, *Taxus baccata* and *Trianthema portulacastrum* showed promising non-narcotic analgesic effects.

9205-3034 Wang, C.M., Ohta, S., Shinoda, M.* (Faculty of Pharmaceutical Sciences, Hoshi University, 2-4-41, Ebara, Shinagawa-ku, Tokyo 142, Japan) **Studies on chemical protectors against radiation. 35. Effects of radioprotective Chinese traditional medicines on radiation-induced lipid peroxidation in vivo and in vitro.** *Chemical & Pharmaceutical Bulletin*, v. 40(2): p. 493-498, 1992 (22 ref, Eng).

The fluctuation of lipid peroxidation (LP) in 9 tissues was investigated in mice for 7d after whole-body X-irradiation with a lethal dose of bone marrow death. LP increased significantly in bone marrow, thymus, spleen and liver

following irradiation, and slightly in brain and testis, but not in blood plasma, submaxillary gland or kidney. The effects of 7 radioprotective Chinese traditional medicines (CTMs) and cysteamine (MEA) on the radiation-induced LP in 4 tissues were studied by i.p. injection before or after irradiation and their LP content in tissues was measured 2d after irradiation. Most CTMs showed significant inhibition of radiation-induced LP in bone marrow and liver, especially when injected prior to irradiation. The in vitro experiments were carried out using mouse liver microsomal suspensions (MS). Each of the 8 radioprotectors was added to MS before or after irradiation and then post-irradiation-incubated at 37 degree C. All markedly inhibited radiation-induced LP if added before irradiation, but were slightly less effective if added after.

9205-3035 Wang, J., Xiao, P.G., Li, S.Y., Gao, P., Wang, R.H. (Department of Immunology, Institute of Medicinal Plant Development, Chinese Academy of Medical Sciences, Beijing 100094, China) **The inhibitory effect of sinomenine on immunological function in mice.** *Phytotherapy Research*, v. 6(3): p. 117-120, 1992 (14 ref, Eng).

Sinomenine, an alkaloid isolated from the stem of *Sinomenium acutum* exhibited clinically good curative effects on arthritis and rheumatoid arthritis. Sinomenine inhibited both the humoral and cellular immunity of mice. The weights of spleen and thymus of mice treated with sinomenine (50-150 mg/kg/d, i.p.) were drastically reduced. The antiship red blood cell antibody production and delayed-type hypersensitivity reaction induced by sheep red blood cells were inhibited by sinomenine at doses of 50, 100 and 150 mg/kg/d; and the survival time of split-heart transplants was also prolonged. In vitro, sinomenine suppressed the proliferation of splenic cells stimulated with LPS and Con A. The immunosuppressive actions of sinomenine have been attributed for its clinical effects in the treatment of arthritis and rheumatoid arthritis.

9205-3036 Wang, J.Z., Chen, M.E., Xu, Y.Q. et al (Third Teaching Hospital, Third Military Medical College, Chongqing 630 042, People's Republic of China) **Effect of *Salvia miltiorrhiza* Co on angiotension II and atrial natriuretic polypeptide in rabbits.** *Chinese Journal of Integrated Traditional and Western Medicine*, v. 11(7): p. 420-421, 1991 (6 ref, Chi, Eng).

Effect of *S.miltiorrhiza* Co (SMC) on the activities of angiotension II (AII) and atrial natriuretic polypeptide (ANP) in rabbits has been investigated by radioimmunoassay. It has been observed that the concentration of AII and ANP in plasma were significantly lower (P), and slightly lower in brain and atrial (P0.05) in SMC group than in the control group.

9205-3037 Wang, W., Chen, W.W.(Beijing College of TCM, Beijing, 100029, China) **Antioxidative activity studies on the meaning of same original of herbal drug and food.** *Chinese Journal of Integrated Traditional and Western Medicine*, v. 11(3): p. 159-161, 1991 (5 ref, Chi, Eng).

The antioxidative activity of aqueous extracts of 6 kinds of common food, *Ziziphus jujuba*, *Crataegus pinnatifida*, fresh *Allium sativum*, fresh *Zingiber officinale*, *Citrus tangerina* and green tea, which are also used as traditional herbal drugs, was studied. The result indicated that all these extracts can scavenge oxygen free radical, inhibit lipid peroxidation of mice liver homogenate (in vivo and in vitro), decrease hyaluronic acid depolymerization induced by oxygen and inhibit the adenosine deaminase activity of mice liver homogenate (in vivo).

9205-3038 Wang, Y.Q., Wei, J.Q., Dai, D.Z.(Research Division of Pharmacology, China Pharmaceutical University, Nanjing 210 009, People's Republic of China) **Preventive effect of Changzhankang in experimental intestinal adhesions in rats.** *Chinese Journal of Integrated Traditional and Western Medicine*, v. 11(8): p. 484-485, 1991 (6 ref, Chi, Eng).

Intestinal adhesions were induced in rats by stabbing the terminal part of the ileum. Adhesion prevention by ibuprofen and Changzhankang(CZK), which was composed by traditional Chinese medicines, was evaluated with a grading system. All of the 13 rats in the non-treated group created severe adhesions. The severity was significantly modified by orally administered CZK of 20g/kg (in crude drugs) once or twice daily for five days (P and P compared with the non-treated). Intramuscular injection of ibuprofen (35 mg/kg, 3 times daily) also alleviated the severity of adhesions. There was no significant difference between the ibuprofen-treated and CZK treated groups though some of the rats were virtually free from adhesion formation in the latter. It is plausible to expect CZK to become a promising drug used in treating intestinal adhesions, for the natural drug has greater security and less side effects than synthesized drugs.

9205-3039 Wei, M.J., Luo, X., Wang, X., Zhu, J.S.(Department of Pharmaceutical Analysis, Shenyang College of Pharmacy, Shenyang 110 015, China) **Study of chemical pattern recognition as applied to quality assessment of the traditional Chinese medicine "Wei Ling Xian".** *Acta Pharmaceutica Sinica*, v. 26(10): p. 772-776, 1991 (10 ref, Chi, Eng).

Chemical pattern recognition was applied to the quality assessment of the traditional Chinese medicine 'Wei Ling Xian', the dried roots and rhizomes of *Clematis*

chinensis, *C.hexapetala*, *C.manshurica*, 21 samples of six different species collected from different regions of China, were extracted with methanol. The extracts were analyzed,"Wei Ling Xian" samples were correlated with their antiinflammatory activity. Accordingly the samples were classified into two groups, one having and the other not having distinct antiinflammatory activity at the 5 percent level.

9205-3040 Wojcicki, J., Samochowiec, L., Juzwiak, S., Dutkiewicz, T.(Institute of Pharmacology and Toxicology, Medical Academy, 70-111 Szczecin, Poland) **Pollen extracts reduce the hepatotoxicity of paracetamol in mice.** *Planta Medica*, v. 57(Supplement 2): p. A64-A65, 1991 (4 ref, Eng).

The protective effect of pollen extracts-Cernitin T60 and Cernitin GBX, obtained from 6 plant species (rye grass, maize, timothy grass, pine, alder flower, orchard grass) was demonstrated against carbon tetrachloride, ethionine, and galactosamine-induced liver damage in mice. It was found that Cernitins are able to increase the survival rate of mice. The serum activities of AlAT and AspAT, measured at 3h after 300 mg/kg paracetamol, increased 38 and 6 times, respectively, in comparison with the control group. Cernitins, given before and after paracetamol, lead to a significant decrease, or even normalization, of these activities. Cernitins were able to prevent the loss of GSH from the liver, which fell to the 20 percent level after paracetamol.

9205-3041 Wysokinska, H., Swiatek, L., Kunert-Radek, J. (Department of Botany, Institute of Environmental Research and Bioanalysis, Medical Academy, Muszynskiego 1, PL-90-151 Lodz, Poland) **Antiproliferative properties of iridoids from tissue cultures of *Penstemon serrulatus*.** *Planta Medica*, v. 57(Supplement 2): p. A65-A66, 1991 (4 ref, Eng).

The influence of penstemide, serrulatololide, and penstemide aglycone on the spontaneous proliferation of mouse spleen lymphocytes or hepatoma cells has been investigated in the Syrian hamster *invitro*. {3H}-Thymidine incorporation into DNA was used as a sensitive index of cell proliferation. Penstemide and serrulatololide inhibited incorporation of {3H}-thymidine into examined DNA cells in the dose-dependent manner at the concentrations 10⁻⁴ and 10⁻⁵ M. The aglycone of penstemide was found to be slightly more active against mouse spleen lymphocytes than penstemide; its antiproliferative activity was observed at the concentrations 10⁻⁴ to 10⁻⁶M. This is the first report of antiproliferative activity of these compounds.

9205-3042 Yang, X.W., Hattori, M., Namba, T., Chen, D.F., Xu, G.J.(Research Institute for Wakan-Yaku (Traditional Sino-Japanese Medicines), Toyama Medical and

Pharmaceutical University, 2630 Sugitani, Toyama 930-01, Japan) **Anti-lipid peroxidative effect of an extract of the stems of *Kadsura heteroclita* and its major constituent, kadsurin, in mice.** *Chemical & Pharmaceutical Bulletin*, v. 40(2): p. 406-409, 1992 (21 ref, Eng).

Three-days successive p.o. administration of an EtOH extract of the stems of *K.heteroclita* (Schizandraceae) or its major constituent, kadsurin, resulted in significant decreases of CCl₄-induced lipid-peroxidation products, such as thiobarbituric acid reactive substances (TBA-RS), conjugated dienes and fluorescent products in the liver of mice. In contrast, a significant restoration of superoxide dismutase (SOD) activity reduced by CCl₄-intoxication was observed in the administered groups, suggesting that the subchronic treatment of mice with the EtOH extract or kadsurin induce enzymes capable of scavenging oxygen radical species in the liver, though the extract and kadsurin themselves may have an anti-oxidant property.

9205-3043 You, S.Y., Ma, L.Y. et.al.(Department of Surgery, First Affiliated Hospital, Tianjin Medical College, Tianjin 300 052, China) **Vasoactive intestinal polypeptide level changes in intestinal obstruction and the influence of Da Cheng Qi Decoction.** *Chinese Journal of Integrated Traditional and Western Medicine*, v. 11(3): p. 162-164, 1991 (10 ref, Chi, Eng).

The role of vasoactive intestinal polypeptide(VIP) in small intestine obstructed rabbits and the therapeutic mechanism of Da Cheng Qi Decoction(DCQD) were studied. DCQD caused a 50 percent decrease of elevated plasma VIP in experimental animals and a 65 percent increase in controls. The present work demonstrated that VIP might be released into the portal and peripheral circulation and mediate local and systemic pathophysiologic alterations accompanying small intestinal obstruction, such as hyperemia and edema of intestinal wall, accumulation of fluid in the lumen. VIP changes might account for the redistribution of blood flow in the obstructed segment of small intestine and the distal site of obstruction. DCQD has a therapeutic effect.

9205-3044 Zhang, J.Q., Zhao, M.(Changhai Hospital, The Second Military Medical College, Shanghai 200 433, China) **Effects of Yin tonics and Yang tonics on serum thyroid hormone levels and thyroid hormone receptors of hepatic cell nucleus in hyperthyroxinemic and hypothyroxinemic rats.** *Chinese Journal of Integrated Traditional and Western Medicine*, v. 11(2): p. 105-106, 1991 (9 ref, Chi, Eng).

Hyperthyroxinemia model was made by giving thyroid tablet suspension to Wistar rats and hypothyroxinemia model was made by thyroidectomy.

Serum thyroid hormone levels were measured by RIA and the parameters of triiodothyronine receptors in rat hepatic cell nucleus by radio-ligand binding assay: Maximal binding capacity(B_{max}) and dissociation constant(K_d). It is found that Yin-tonics can lower serum thyroid hormone levels and B_{max} of hepatic nuclear T₃R of hyperthyroxinemia rat. Both Yang-tonics I and II can raise serum thyroid hormone levels of hypothyroxinemia rats, but not B_{max} of hepatic nuclear T₃R. Yang-tonics I even lowers B_{max}. All the Chinese herbs have no effect on the K_d of rat hepatic nuclear T₃R. The results may have some value in studying the effects of Chinese medical drugs.

9205-3045 Zhang, Y.H., Liu, Y.L., Yan, S.C.(Institute of Chinese Materia Medica, China Academy of TCM, Beijing 100 070, China) **Effect of *Polyporus umbellatus* polysaccharide on function of macrophages in the peritoneal cavities of mice with liver lesions.** *Chinese Journal of Integrated Traditional and Western Medicine*, v. 11(4): p. 225-226, 1991 (3 ref, Chi, Eng).

The cells in peritoneal cavities of mice were taken out and cultured in vitro. The amount to release H₂O₂ of the macrophages was assayed by fluorimetry. *P.umbellatus* polysaccharide (PUP) could not only increase the number of macrophages and the amount of H₂O₂ release in the peritoneal cavities of normal mice, but also raise the lowered number of macrophages and the ability to release H₂O₂ in the peritoneal cavities of the mice with liver lesions caused by CCl₄ significantly. So PUP could improve the cellular immunity of normal mice and the mice with liver lesions.

9205-3046 Zhang, Y.Q., Liu, Y.F., Yu, L.H. et.al.(Guang-an-men Hospital, China Academy of TCM, Beijing 100053, People's Republic of China) **Effect of herbal prostatitis decoction on experimental prostatitis in rats.** *Chinese Journal of Integrated Traditional and Western Medicine*, v. 11(8): p. 480-482, 1991 (3 ref, Chi, Eng).

Herbal prostatitis decoction (DG) was given to rats having experimental fibrous proliferation type prostatitis. Microscopically, both inflammatory cell infiltration and fibroblast proliferation of interstitial tissue in the DG treated group were slight than that in the control group (P less than 0.025, P less than 0.05). Transmission electron microscopic observations showed both the secretory particles and metal-granule-like substances(including Zn) of the gland cells in the drug treated group were increased. The lysosomes in the cytoplasm were also increased.

Antimicrobial Activity

9205-3047 Bilgrami, K.S., Sinha, K.K., Sinha, A.K.(University Department of Botany, Bhagalpur Univer-

sity, Bhagalpur, Bihar, India) **Inhibition of aflatoxin production & growth of *Aspergillus flavus* by eugenol & onion & garlic extracts.** *Indian Journal of Medical Research*, v. 96B(June): p. 171-175, 1992 (18 ref, Eng).

Efficacy of natural non-toxic materials including extracts of onion and garlic as well as eugenol was tested against aflatoxin production by *A.flavus* in liquid SMKY medium and in maize grains. Maximum inhibition in the mycelial growth occurred with garlic extract (61.94 percent), whereas inhibition of aflatoxin production was highest (60.44 percent) due to onion extract. Eugenol was most suitable for inhibiting aflatoxin production (60.35 percent) on maize grains.

9205-3048 Bodinet, C., Beuscher, N.(Schaper & Brummer, D-3320 Salzgitter, Federal Republic of Germany) **Antiviral and immunological activity of glycoproteins from *Echinacea purpurea* radix.** *Planta Medica*, v. 57(Supplement 2): p. A34, 1991 (2 ref, Eng).

After i.v. administration of retentate from *E.purpurea* roots to mice, the sera of these animals were obtained and analysed for TNF-alpha and IL-1 activity by means of specific bioassays. The retentates caused a significant, dose-dependent IL-1 and TNF-alpha release in vivo. The amount of the produced cytokines was comparable to that induced in mice by treatment with LPS L-7136 from *Salmonella typhosa*. The first three fractions from a Sephadex G-50 chromatography had cytokine-inducing capacity. These fractions contained high amounts of a glycoprotein. After administration of these glycoprotein-containing fractions to mouse-spleen cell cultures, significant amounts of IFN alpha,beta were produced by these cells. It is concluded that the glycoprotein containing fractions of *E.purpurea* root extracts are able to induce the secretion of TNF alpha, IL-1, and IFN alpha,beta. Besides this, they are at least partially responsible for the antiviral activity of *E.purpurea* radix.

9205-3049 Brantner, A., Brantner, H.(Institut für Pharmakognosie, Universität Graz, A-8010 Graz, Austria) **Screening of flavonoid aglycones and glycosides for antimicrobial activity.** *Planta Medica*, v. 57(Supplement 2): p. A43-A44, 1991 (4 ref, Eng).

The activity of flavonoids was tested against Gram-positive as well as Gram-negative human pathogenic bacteria and yeast. Flavonoid compounds like flavones, flavonols, flavanones, and glycosides were dissolved in dimethyl sulfoxide and TWEEN 80 in a concentration range from 50 to 800 micro/ml nutrient medium. The results are reported.

9205-3050 Castro, C., Jimenez, M., Gonzalez-De-La Parra, M. (Syntex, S.A. de C.V., Cerrada de Bezares No.9, Col.

Lomas de Bezares, 11910 Mexico D.F., Mexico) **Inhibitory effect of piquerol A on the growth of epimastigotes of *Trypanosoma cruzi*.** *Planta Medica*, v. 58(3): p. 281-282, 1992 (9 ref, Eng).

The inhibitory effect of different concentrations of piquerol A (isolated from *Piqueria trinervia* on the growth of epimastigotes of *T.cruzi*. Piquerol A at concentrations 200 microg/ml arrested the growth of these cells from the initial point and through out the four day period, which suggests its use for the treatment of Chagas diseases.

9205-3051 Cimanga, K., Pieters, L., Claeys, M., Vanden Berghe, D., Vlietinck, A.J.(Faculty of Medicine, University of Antwerp(UIA), B-2610 Antwerp, Belgium) **Biological activities of cryptolepine, an alkaloid from *Cryptolepis sanguinolenta*.** *Planta Medica*, v. 57(Supplement 2): p. A98-A99, 1991 (5 ref, Eng).

Bioassay-guided isolation using *Bacillus cereus* as the antimicrobial test microorganism of the acid alcoholic extract of the root bark of *C.sanguinolenta* from Central Africa, has led to a purple alkaloid, which was identified by spectroscopic methods as cryptolepine. This compound was screened for putative antiviral, antifungal, and antibacterial activities. The results indicated that the substance exhibited prominent activities against the yeast *Candida albicans* and all Gram-positive bacteria tested. Only a weak activity was found against several Gram-negative bacteria such as *Salmonella typhi*, *Escherichia coli*, and *Enterobacter aerogenes*, whereas neither antifungal nor antiviral properties could be detected. The alkaloid, however, was quite toxic to the host cells in the antiviral *in vitro* testing system in concentrations from 1 micro g/ml.

9205-3052 Ferdous, A.J., Islam, S.N., Ahsan, M., Hasan, C.M., Ahmed, Z.U.(Department of Pharmacy, University of Dhaka, Dhaka 1000, Bangladesh) **In vitro antibacterial activity of the volatile oil of *Nigella sativa* seeds against multiple drug-resistant isolates of *Shigella* spp. and isolates of *Vibrio cholerae* and *Escherichia coli*.** *Phytotherapy Research*, v. 6(3): p. 137-140, 1992 (14 ref, Eng).

The antibacterial activity of the volatile oil of *N.sativa* seeds was studied against 37 isolates of *S.dysenteriae* 1, *S.flexneri*, *S.sonnei* and *S.boydii* and 10 strains of *V.cholerae* and *E.coli*. Most of the strains were clinically resistant to ampicillin, co-trimoxazole and tetracycline. All the strains tested showed promising sensitivity to the volatile oil. The minimum inhibitory concentration of the volatile oil for *Shigella*, *Vibrio* and *Escherichia* strains tested was between 50-400 microg/ml.

9205-3053 Gasquet, M., Quetin-Leclercq, J., Timon-David, P., Balansard, G., Angenot, L.* (Institut de Pharmacie, Faculte de Medecine, Universite de Liege, rue Fusch, 5, B-4000 Liege, Belgium) **Antiparasitic properties of diploceline, a quaternary alkaloid from *Strychnos gossweileri***. *Planta Medica*, v. 58(3): p. 276-277, 1992 (15 ref, Eng).

The results of studies on diploceline, a quaternary alkaloid isolated from the root bark of *S.gossweileri* are reported. Its mutagenic or antimutagenic effects (inhibition of the mutagenicity of both benzo{a}pyrene and smoker urine) are also investigated. The results indicate that the alkaloid is devoid of any mutagenic or antimutagenic effect at 2.5 mg/ml. It does not produce any inhibition of *Plasmodium falciparum* growth at maximum tested concentration (25 microg/ml. But it is active at 25 microg/ml on *Trichomonas vaginalis* and at 50 microg on *Entamoeba histolytica*.

9205-3054 Heinrich, M., Kuhnt, M., Wright, C.W., Rimpler, H., Phillipson, J.D., Schandelmaier, A., Warhurst, D.C. (Institut für Pharmazeutische Biologie der Universität, Schanzlestr. 1, D-7800 Freiburg, Federal Republic of Germany) **Lowland Mixe Indian medicinal plants: Parasitological and microbiological evaluation and initial phytochemical study of *Chaptalia nutans***. *Planta Medica*, v. 57(Supplement 2): p. A5-A6, 1991 (6 ref, Eng).

Twenty nine plants were tested against *Entamoeba histolytica*, three bacteria (*Bacillus subtilis* DSM 347, *Escherichia coli* DSM 1077, *Micrococcus luteus* DSM 348), and two fungi (*Cladosporium cucumerinum* CBS 108.23, *Penicillium oxalicum* NCBS 219.30). *Chaptalia nutans* was further fractionated using LC on silica gel and reversed phase material and yielded the 5 methylcoumarin-glucoside with antimicrobial activity.

9205-3055 Hussan, G.P., Vilagines, P., Sarrette, B., Vilagines, R. (Faculte de Pharmacie, Laboratoire d'Hydrologie, 4, avenue de l'Observatoire, 75270 Paris, France) **Antiviral effects of bulb extracts of *Amaryllidaceae* on three entero viruses and a rotavirus**. *Plantes Medicinales et Phytotherapie*, v. 25(2-3): p. 89-99, 1991 (28 ref, Eng, Fre).

An hydro-alcoholic extract from *Haemanthus albiflos* (Amaryllidaceae) bulbs was tested for its potential antiviral properties against three enteroviruses: Poliovirus type I, Echovirus type II, Coxsackivirus B type 2, and one reoviride: rotavirus SA II. Assays were performed on different cell cultures in microplates (HeLa S3, MA 104 and BGM). Positive results were observed with these four viruses.

9205-3056 Kedzia, B., Segiet-Kujawa, E., Holderna, E., Krzyzaniak, M. (Instytut Roslin i Przetworow Zielarskich, ul. Libelta 27, 61-707 Poznan, Polska) **(Chemical content and antimicrobial activity of sage essential oil (salvia oil))**. *Herba Polonica*, v. 36(4): p. 155-163, 1990 (27 ref, Eng, Pol).

There was no important difference between the sage essential oil obtained from local raw material and the essential oils obtained from other European countries. It contained on an average (percent), 53.1 of thujone, 14.8 of camphor, 7.3 of cineol and 6.6 of beta-caryophyllene. Contents of other identified components (camphane, alpha-humulene, borneol, bornyl acetate, alpha- and beta-pinene, limonene, p-cymene, beta-myrcene and linalool) were from 0.4 to 3.9 percent. Sage oil and its components exhibited moderate antibacterial activity. Its activity on fungi was differential, strongly inhibiting the dermatophytes *M.gypseum*.

9205-3057 Kedzia, B. (Instytut Roslin i Przetworow Zielarskich ul. Libelta 27, 61-707 Poznan, Polska) **Antimicrobial activity of oil *Chamomillae* and its components**. *Herba Polonica*, v. 37(1): p. 29-38, 1991 (45 ref, Eng, Pol).

Chamomillae oil *Matricaria chamomilla* is characterized by moderate antimicrobial activity. Its effect on Gram-positive bacteria and yeasts and mould is stronger than on Gram-negative bacteria. From essential oil components, alpha-bisabolol has the strongest activity on Gram-positive and Gram-negative bacteria and on pathogenic fungi. Chamazulene shows the strong antimicrobial activity, too. Alpha-bisabolol oxides show considerably weaker activity on above mentioned microorganisms. Whereas spiroether is characterized by weak activity on Gram-positive bacteria, inactivity on Gram-negative bacteria and moderate activity on fungi. Thus chamomile essential oils with high composition of alpha-bisabolol and chamazulene have high antimicrobial activity.

9205-3058 Lemos, T.L.G., Monte, F.J.Q., Matos, F.J.A., Alencar, J.W., Craveiro, A.A., Barbosa, R.C.S.B., Lima, E.O. (Universidade Federal do Ceara-UFC, Laboratorio de Produtos Naturais, Departamento de Quimica Organica e Inorganica, Caixa postal 12.200, 60.021 - Fortaleza, Ceara-Brasil) **Chemical composition and antimicrobial activity of essential oils from Brazilian plants**. *Fitoterapia*, v. 63(3): p. 266-268, 1992 (9 ref, Eng).

Chemical composition of the essential oils obtained from leaves of *Croton mucronifolius*, *C.triangularis*, *Lippia gracilis*, *L.microphylla*, *Cymbopogon nardus* and fruits of *Xylopia sericea* has been determined. The broadest range of antimicrobial activity was observed with *L.gracilis* and

X.sericea. A very good antifungal activity was observed with the essential oil of *C.nardus*.

9205-3059 Mbela, T.K.M., Shabani, M., Dieyi, S., Ciman-ga, K., Moswa, L.(Department of Pharmaceutics and Drug Analysis, Laboratory of Pharmaceutical Chemistry and Technology, Faculty of Pharmacy, University of Kinshasa P O B 212, Kinshasa 11, Zaire) **Amoebicidal, fungicidal and bactericidal properties of bark extracts of *Gardenia jovis tonantis***. *Fitoterapia*, v. 63(2): p. 179-181, 1992 (10 ref, Eng).

Stem bark extracts of *G.jovis tonantis* exhibited significant antibacterial, antifungal and antiamebic activities in vitro. Saponins, polyphenols and tannins have been detected in the extracts.

9205-3060 Misra, T.N., Singh, R.S., Pandey, H.S., Prasad, C., Singh, B. P.(Natural Products Research Laboratory, Department of Chemistry, University of Gorakhpur, Gorakhpur 273 009, UP, India) **Antifungal essential oil and long chain alcohol from *Achyranthes aspera***. *Phytochemistry*, v. 31(5): p. 1811-1812, 1992 (5 ref, Eng).

An essential oil and a new long chain alcohol have been isolated from the shoots of *A.aspera*. The oil exhibited antifungal activity against *Aspergillus carneus* and the isolated alcohol has been characterized as 17-pentatriacontanol.

9205-3061 Navarro, E., Alonso, S.L., Boada, J., Trujillo, J., Ayuso, M.J., Gutierrez Navarro, A.(Departamento de Farmacologia, Facultad de Medicina, Universidad de La Laguna, Tenerife, Canary Islands, Spain) **Quinolic derivatives: biological activity**. *Fitoterapia*, v. 63(3): p. 251-254, 1992 (17 ref, Eng).

The quinolic compounds halleridone, hallerone and epoxyhallerone (minor constituents of *Isoplexis canariensis* var. *tomentosa*), were photosynthesised and investigated for their antimicrobial activity. Hallerone exhibited great antimicrobial efficacy against various microorganisms, presenting also antifungal activity.

9205-3062 Ndounga, M., Ouabonzi, A. , Koubemba-Makambila, M.C., Mpati, J. , Bilala, J.P.(Laboratoire de Pharmacologie, CERVE, BP 1249, Brazzaville, Congo) **Bacteriostatic activity and acute toxicity of *Syzygium brazzavillense* (Myrtaceae)**. *Plantes Medicinales et Phytotherapie*, v. 25(2-3): p. 141-146, 1991 (8 ref, Eng, Fre).

Bark and leaf aqueous extracts of *S.brazzavillense* have a significant bacteriostatic effect. Acute toxicity study on mice shows that leaf extract is not toxic orally, however,

when given intraperitoneally this extract exhibits a high lethal effect.

9205-3063 Ogunleye, D.S., Onaolapo, J.A.(Department of Pharmaceutical and Medicinal Chemistry, Ahmadu Bello University, Zaria, Nigeria) **Studies on antimicrobial activities of extracts of some plants used in traditional medicine in northern Nigeria**. *Planta Medica*, v. 57(Supplement 2): p. A44, 1991 (5 ref, Eng).

The antimicrobial activity of both organic (ethanol: chloroform, 50:50) and aqueous (distilled water) extracts of *Striga senegalensis*, *Ximenia americana* and *Ficus syringifolia* was determined. The antimicrobial activities exhibited by the extracts correlated well with the chemical constituents of the extracts. The organic extract of *X.americana* contains sambunigrin, a cyanogenic constituent which may account for its activity. The aqueous extract of *F.syringifolia* showed activity due to the coumarin content. Both aqueous and organic extracts of *S.senegalensis* showed activity due to flavonoid glycosides.

9205-3064 Oloke, J.K.(Department of Pure & Applied Biology, Oyo State University of Technology, Ogbomoso, Nigeria) **Fungicidal effects of the volatile oil of *Aframomum melegueta***. *Fitoterapia*, v. 63(3): p. 269-270, 1992 (5 ref, Eng).

The essential oil obtained from the seeds of *A.melegueta* exhibited strong antifungal activity against two test fungi *Trichophyton mentagrophytes* and *Aspergillus niger*.

9205-3065 Oyedele, A.O., Lamikanra, A. , Orafidiya, L.O. (Department of Pharmaceutics, Faculty of Pharmacy, Obafemi Awolowo University, Ile-Ife, Nigeria) **Physical and antibacterial characteristics of the volatile oil of *Hemizygia welwitschii* (Rolfe)**. *Phytotherapy Research*, v. 6(4): p. 224-226, 1992 (16 ref, Eng).

The physical properties and antibacterial profile of the steam-distilled volatile oil from twigs of *H.welwitschii* have been studied. The volatile oil content of the plant was affected by the time of the day the twigs were collected and extracted, being relatively higher in daytime than at night. The oil content was higher in the leaves than in the stems and branches, the average yield was 0.11 percent v/w. The oil exhibited antibacterial activity against *Staphylococcus aureus*, *Escherichia coli*, *Bacillus subtilis* and *Pseudomonas aeruginosa*, the latter being the most resistant organism.

9205-3066 Ratnayake Bandara, B.M., Hewage, C.M.* , Karunaratne, V. , Wannigama, G.P. , Adikaram, N.K.B.(Department of Chemistry, University of

Peradeniya, Peradeniya, Sri Lanka) **An antifungal chromene from *Eupatorium riparium***. *Phytochemistry*, v. 31(6): p. 1983-1985, 1992 (9 ref, Eng).

Methylripariochromene A (6-acetyl-7,8-dimethoxy-2,2-dimethylchromene), a root constituent of *E. riparium* displayed antifungal activity against five of the seven fungal species tested. The chromene showed a toxicity to the fungus *Colletotrichum gloeosporioides*, a tropical pathogen, comparable to that of a commercial fungicide, although the chromene appeared to be fungistatic.

9205-3067 Schneider, K., Novak, A., Kubelka, W. (Institut für Pharmakognosie, Universität Wien, Wahringer Str.25, A-1090 Wien, Austria) **Antibacterial activity and organoleptic properties of *Sideritis clandestina***. *Planta Medica*, v. 57(Supplement 2): p. A45, 1991 (1 ref, Eng).

Various samples of "Greek Mountain Tea" commercially available in Austrian health-foodstores, containing the dried inflorescences, were identified morphologically and anatomically as *S. clandestina* ssp. *clandestina*. Steam distillation yielded approx. 0.1 percent (v/m) of a greenish-yellow essential oil with a strong sage-like smell and taste. In accordance to anatomic findings, a comparative TLC investigation of the distribution of the essential oil showed that the majority of the essential oil was present in the flowery region; the leaves, and stems were practically oil-free. The organoleptic properties of "Greek Mountain Tea" were determined. The tea exhibited marked antibacterial activity against *Staphylococcus aureus*.

9205-3068 Serkedjieva, J., Abrashev, I., Gegova, G., Manolova, N. (Institute of Microbiology, Bulg Academy Science, Acad., G Bonchev str., bl. 26, Sofia, Bulgaria) **A polyphenolic complex isolated from *Geranium sanguineum* inhibits influenza virus neuraminidase**. *Fitoterapia*, v. 63(2): p. 111-117, 1992 (20 ref, Eng).

A polyphenolic complex isolated from the Bulgarian medicinal plant *G. sanguineum* inactivated the neuraminidase activity of different influenza virus strains. The effect was independent on the dose of the substance, the time of treatment and the temperature of the reaction. The inhibition of the neuraminidase activity corresponded to a decrease of the hemagglutination and the infectious titres and was reversible.

9205-3069 Syed, Meena, Riaz, M., Chaudhari, F.M. (PCSIR Laboratories Complex, Lahore 54600, Pakistan) **The antibacterial activity of the essential oils of the Pakistani *Acorus calamus*, *Callistemon lanceolatus* and *Laurus nobilis***. *Pakistan Journal of Scientific and Industrial Research*, v. 34(11): p. 456-458, 1991 (25 ref, Eng).

The essential oils of *A. calamus*, *C. lanceolatus* and *L. nobilis* have been tested against *Staphylococcus aureus*, *Escherichia coli*, *Shigella flexneri*, and *Salmonella typhi*, para-A, spectrophotometrically in emulsified broth. All the essential oils were found to be active against the pathogens of intestinal tract whereas the oil of *C. lanceolatus* enhanced the growth of *S. aureus* in the medium. The essential oils from different parts of the same plant, did not differ in their activity.

9205-3070 Tedlaouti, F., Gasquet, M., Delmas, F., Timon-David, P., Elias, R., Vidal-Ollivier, E., Crespin, F., Balansard, G. (Laboratoire de Parasitologie, Faculté de Pharmacie, 27 Bd. Jean Moulin, F-13385 Marseille Cedex 5, France) **Antitrypanosomal activity of some saponins from *Calendula arvensis*, *Hedera helix*, and *Sapindus mukurossi***. *Planta Medica*, v. 57(Supplement 2): p. A78, 1991 (4 ref, Eng).

The in vitro antitrypanosomal activity of some saponins extracted from *C. arvensis*, *H. helix* and *S. mukurossi* was studied on *Trypanosoma brucei brucei*. Bidesmosides have shown no effect on *Trypanosoma brucei brucei*. Monodesmosides and hederagenin (sodium salts) exhibit moderate antitrypanosomal activity, especially alpha-hederin and sapinodside C (MIC=25 microg/ml).

9205-3071 Tripathi, S.C., Chaturvedi, R.V., Upadhyay, P.D. (Department of Botany, University of Gorakhpur, Gorakhpur 273 009, UP, India) **Effect of volume and height on fungitoxicity of volatile constituents**. *Journal of Indian Botanical Society*, v. 69(3-4): p. 471-472, 1990 (Recd. 1992; 8 ref, Eng).

An amount of 0.01 ml of anethole as well as eugenol completely prevented the fungal growth of the fungus *Aspergillus flavus*, in glass cylinders of 30 ml volume upto a height of 15 cm. 0.01/ml of anethole was needed to inhibit the fungal growth in petriplates of 5 cm diameter, while 0.02 ml of anethole was required for petriplates of 8 cm diameter.

9205-3072 Tumen, G., Ayhan, Z. (Department of Biology, Faculty of Education, University of Uludag, Balikesir, Turkey) **Antimicrobial activity of essential oils of two *Ziziphora* species growing in Turkey**. *Fitoterapia*, v. 63(3): p. 264-265, 1992 (9 ref, Eng).

The essential oil obtained by hydrodistillation from *Z. taurica* ssp. *cleonioides* (yield 1.22 percent) and *Z. taurica* ssp. *taurica* (yield 0.4 percent) were found to be active against *Klebsiella pneumoniae*, *Pseudomonas maltophilia*, *Escherichia coli* and *Staphylococcus aureus*. *Z. taurica* ssp. *Cleonioides* oil has the greatest activity against *Pseudomonas* and *Klebsiella*.

9205-3073 Vukusic, I., Pepeljnjak, S., Kustrak, D., Grun-gold, D. (Podravka-Belupo, Food and Pharmaceutical Industry, Research and Development Institute, YU-43300 Koprivnica, Croatia, Yugoslavia) **Investigation of the antimycotic activities of *Chelidonium majus* extract.** *Planta Medica*, v. 57(Supplement 2): p. A46, 1991 (5 ref, Eng).

The antimycotic activity of ethanolic drug extracts of *C.majus* which were prepared from dried plant material was tested.

9205-3074 Wright, C.W., Allen, D., Cai, Ya, Phillipson, J.D., Said, I.M., Kirby, G.C., Warhurst, D.C.(Department Pharmacognosy, The School of Pharmacy, 29/39 Brunswick Square, London WC1N 1AX, UK) **In vitro antiamoebic and antiplasmodial activities of alkaloids isolated from *Alstonia angustifolia* roots.** *Phytotherapy Research*, v. 6(3): p. 121-124, 1992 (14 ref, Eng).

Nine alkaloids from *A.angustifolia* have been assessed for antiprotozoal activities against *Entamoeba histolytica* and *Plasmodium falciparum* in vitro. Three dimeric alkaloids, macrocarpamine, macralstonine acetate (semisynthetic) and villastonine were found to possess significant activity against both protozoans. The monomeric alkaloids, alstonerine, alstophylline, 11-methoxyakuammicine, norfluorocurarine, pleiocarpamine and vincamajine were all considerably less active than the dimers: macralstonine base was found to be inactive.

Insecticidal & Piscicidal Activity

9205-3075 Gonzalez-Coloma, A., Cabrera, R., Castanera, P., Gutierrez, C., Fraga, B.M.(Instituto de Productos Naturales y Agrobiologia, CSIC, Ave. Astrofisico F.Sanchez 2, 38206 La Laguna, Tenerife, Canary Islands, Spain) **Insecticidal activity and diterpene content of *Persea indica*.** *Phytochemistry*, v.31(5):p.1549-1552, 1992 (19 ref, Eng).

Extracts of *P.indica* were toxic against *Macaronesia fortunata* and *Heliothis armigera*. Two insecticidal diterpenes, ryanodol and cinnceylanol, were present in the plant's petrol, methanol and water extracts. The methanol extract produced the highest larval mortality and growth reduction against *M.fortunata*, and also had a negative effect against *H.armigera* larvae. The reduction in both larval weight and development brought about by the components of the petrol extract can be partially attributed to the presence of the two diterpenes, but these products alone, however, do not explain the high toxicity of the methanol extract. The differential effect of the methanol extract and the potential use of *P.indica* for pest control are discussed.

9205-3076 Hofmann, J.J., Jolad, S.D., Hutter, L.K., McLaughlin, S.P.(Bioresources Research Facility, University of Arizona, 250 East Valencia Road, Tuscon, Arizona 85706, USA) **Glaucarubolone glucoside, a potential fungicidal agent for the control of grape downy mildew.** *Journal of Agricultural and Food Chemistry*, v. 40(6): p. 1056-1057, 1992 (3 ref, Eng).

A methanol extract of *Castela emoryi* was active as both a preventive and a curative agent against grape downy mildew infestation. 15-Glucopyranosyl glaucarubolone was identified as active constituents. In the same assay holacanthone, a quassionoid from this plant was found to be phytotoxic.

9205-3077 Ibrahim, A.M.(Applied Biosciences, Faculty of Science and Technology, University of Gezira, P O Box 2667, Khartoum, Sudan) **Anthelmintic activity of some Sudanese medicinal plants.** *Phytotherapy Research*, v. 6(3): p. 155-157, 1992 (18 ref, Eng).

The anthelmintic activity of aqueous extracts (0.25-50 mg/mL) from 14 plant species that represent seven families of the Sudanese flora was examined using the free living rhabditid nematode, *Caenorhabditis elegans* as a test organism. Extracts of *Balanites aegyptiaca* and *Sesbania sesban* were the most effective. Extracts of *Albizia anthelmintica*, *Cymbopogon narvatus*, *Abrus precatorius*, *Rhyncosia minima*, *Striga hermonthica* and *Anogeissus leiocarpa* were less effective in this model test system. Extracts of six plant species, *Albizia malacophylla*, *Gardenia lutea*, *Physostigma mesoponticum*, *Salvadora persica*, *Xeromphis nilotica* and *Waltheria indica* had no effect upon *C.elegans* survival.

9205-3078 Krug, E., Proksch, P.(Institut fur Botanik und Pharmazeutische Biologie, Universitat Wurzburg, Mittlerer Dallenbergweg 64, D-8700 Wurzburg, Federal Republic of Germany) **Effect of toxic plant alkaloids on survival, growth and development of *Spodoptera littoralis*.** *Planta Medica*, v. 57(Supplement 2): p. A39, 1991 (3 ref, Eng).

About 20 plant alkaloids namely, tropane, quinoline quinolizidine and isoquinoline alkaloids were analysed for their effects on survival, growth, and development of larvae from *S.littoralis*. Most of the alkaloids studied showed no adverse effects on survival, growth, or development of the larvae. Only colchicine, berberine, and quinine were found to be active. The latter two substances were feeding deterrents which retarded growth and development of the larvae in a dose-dependent manner. Colchicine was the only alkaloid encountered which proved to be toxic to the larvae.

9205-3079 Kubo, I., Ying, B.P., Castillo, M., Brinen, L.S., Clardy, J.(Division of Entomology and Parasitology, Col-

lege of Natural Resources, University of California, Berkeley, CA 94720, USA) **Podoandin, a molluscicidal sesquiterpene lactone from Podocarpus andina.** *Phytochemistry*, v. 31(5): p. 1545-1548, 1992 (15 ref, Eng).

A novel sesquiterpene lactone, podoandin, has been isolated from the leaves of *P.andina*. Its structure has been established by means of spectroscopic data and confirmed by X-ray diffraction analysis. It exhibited moderate molluscicidal activity as well as other biological activities.

9205-3080 Lawton, J.R., Govender, H., Rogers, C.B.(Electron Microscope Unit, University of Durban-Westville, Durban 4000, Republic of South Africa) **Mollic acid glucoside: A possible (Third World) answer to the control of Schistosomiasis in South and Central Africa.** *Planta Medica*, v. 57(Supplement 2): p. A74, 1991 (4 ref, Eng).

A mixtures of acidic triterpenoids and their glycosides was isolated from fresh leaves of 18 *Combretum* species by the simple process of washing the leaves in a hot, 1 percent NaHCO₃ solution. Both the anatomy of the scales found on the leaf surface and the composition of the secreted acidic triterpenoids are species-specific. Furthermore, comparative TLC analysis shows that the extracts obtained by this method are almost identical to the extracts obtained by the more time-consuming Soxhlet and methanol digestion extractions. Dried whole leaves and fresh whole leaves from *C.molle* yielded +0.8 percent and +0.25 percent mollic acid glucoside, respectively. These yields plus the stability and low mammalian toxicity of the sodium salt of mollic acid glucoside and its cheap, unsophisticated extraction from *C.molle* leaves could qualify this compound as an ideal-plant-derived molluscicide.

9205-3081 Oji, O., Madubuike F.N., Oji, P.O. , Nwaigbo, L.C. (School of Agriculture, Imo State University, Okigwe, Nigeria) **Insecticidal activity of Xylopi aethiopica and Piper guineense on the stored bean beetle.** *Fitoterapia*, v. 63(2): p. 181-183, 1992 (8 ref, Eng).

Fruit dust and ethanol extracts of *X.aethiopica* and *P.guineense* exhibited insecticidal activity against *Callosobruchus maculatus*. Dust preparation of *P.guineense* was significantly more toxic than that of *X.aethiopica*. *Piper* dust also protected cowpea grains for a longer period. Unlike *piper*, *Xylopi aethiopica* dust showed significant loss of activity after 100 days of treatment. Plant extracts caused more rapid kill than the dusts.

9205-3082 Saleh, M., Hashim, F., Glombitza, K.W.(Pharmaceutical Science Department, National Research Centre, Cairo, Egypt) **Volatile constituents of Dictyota dichotoma var. implexa and their biological activity.**

Planta Medica, v. 57(Supplement 2): p. A23, 1991 (4 ref, Eng).

The volatile constituents of *D.dichotoma* var.*implexa* were identified and tested for biological activity. The molluscicidal potency of the crude diethyl ether fraction on the snails was elucidated:LC50=21,17 ppm for *Biomphalaria alexandrina* and *Bulbinus truncatus* snails, respectively. The antibiotic activity of the crude diethyl ether fraction was tested with the disc method. *Streptococcus thermophilus* and *Proteus vulgaris* have been proved to be the most sensitive organisms, followed by *Aspergillus niger* and *Bacillus cereus*. The lowest growth inhibition was observed with *Shizosaccharomyces pompe*, *Escherichia coli*, and *Sarcina citrea*.

9205-3083 Sharma, R.N., Gupta, A.S. , Patwardhan, S.A., Hebbalkar, D.S., Tare, V., Bhonde, S.B.(Division of Organic Chemistry, National Chemical Laboratory, Pune 411 008, Maharashtra, India) **Bioactivity of Lamiaceae plants against insects.** *Indian Journal of Experimental Biology*, v. 30(3): p. 244-246, 1992 (20 ref, Eng).

Extracts of 22 plant species were examined for 7 biological activities against different insect pests/vectors. Except 4, all of the extracts showed one or more activities against one or more insect pests/vectors. *Dysophylla tomentosa* extract showed maximum number of activities against a broad spectrum of insects. Extract from *Lavandula perotetti* and *Pogostemon plectranthoides* exhibited more than four biological activities. None of the plants tested showed any juvenile hormone activity.

9205-3084 Stadler, M., Dagne, E., Anke, H.(Lehrbereich Biotechnologie der Universitat, Kaiserslautern, D-6750 Kaiserslautern, Federal Republic of Germany) **Nematicidal activities of medicarpin and 4-hydroxymedicarpin from Taverniera abyssinica.** *Planta Medica*, v. 57(Supplement 2): p. A13, 1991 (5 ref, Eng).

The methanol and acetone extracts of "Dingetegna" (*T.abysinica*) were active against *Caenorhabditis elegans*. Two nematicidal compounds were isolated. Their identity with medicarpin and 4-hydroxymedicarpin was proven by means of UV, IR, mass, and NMR spectroscopy. Both compounds exhibited an LD50 of 25 micro g/ml towards *C.elegans*. Cytotoxic activity was observed at concentration of 100micro g/ml or higher. No hemolytic activity towards bovine erythrocytes was observed upto 100 micro g/ml.

Phytochemistry

9205-3085 Abou-Donia, A.H., Abib, A.A. , El-Din, A.S., Evidente, A., Gaber, M. , Scopa, A.(Department of Pharmacognosy, University of Alexandria, Alexandria, Egypt)

Two betaine-type alkaloids from Egyptian *Pancratium maritimum*. *Phytochemistry*, v. 31(6): p. 2139-2141, 1992 (18 ref, Eng).

Two 2-oxyphenanthridinium alkaloids have been isolated from Egyptian *P.maritimum* and identified as ungeremine and zefbetaine using spectroscopic and chemical methods. The identification of zefbetaine was supported by its partial synthesis from pseudolycorine and by comparison with its unnatural isomer, isozefbetaine, which was in turn prepared from sternbergine.

9205-3086 Achenbach, H., Lowel, M., Waibel, R., Gupta, M., Solis, P.(Institute of Pharmacy and Food Chemistry, Department of Pharmaceutical Chemistry, University of Erlangen, D(W)-8520 Erlangen, Federal Republic of Germany) **New lignan glucosides from *Stemmadenia minima*.** *Planta Medica*, v. 58(3): p. 270-272, 1992 (15 ref, Eng).

Reinvestigation of the polar fractions from the stem bark of *S.minima* afforded two known and four new lignan glucosides. Their structures were deduced by spectroscopic and chemical methods.

9205-3087 Adams, R.P., Thappa, R.K., Agarwal, S.G., Kapahi, B.K., Sarin, Y.K.(Essential Oil and Plant Survey Divisions, Regional Research Laboratory, CSIR, Jammu Tawi 180 001, J&K, India) **The volatile leaf oils of *Juniperus semiglobosa* Regel from India compared with *J.excelsa* M.-Bieb. from Greece.** *Journal of Essential Oil Research*, v.4(2): p. 143-149, 1992 (24 ref, Eng).

Analyses of high- and low-cedrol volatile leaf oils of *Juniperus semiglobosa* from India showed the taxon to be rich in sabinene (12.3-29.2 percent), p-cymene(0.4-8.5 percent), terpinen-4-ol (trace-11.0 percent) with cedrol ranging from 34.1 to 1.5 percent. Contrary to some reports, comparisons of the volatile leaf oils of *J.semiglobosa* from India with those from *J.excelsa* from Greece indicates that *J.semiglobosa* is not conspecific with *J.excelsa*.

9205-3088 Addae-Mensah, I., Achenbach, H.*., Thoithi, G.N., Waibel, R., Mwangi, J.W.(Department of Pharmaceutical Chemistry, Institute of Pharmacy, University of Erlangen, Germany) **Epoxychiromodine and other constituents of *Croton megalocarpus*.** *Phytochemistry*, v. 31(6): p. 2055-2058, 1992 (10 ref, Eng).

A novel clerodane-type diterpene with a 6,7-oxirane group has been isolated from *C.megalocarpus*. Structure elucidation has been achieved by a combination of spectroscopic measurements including 2D NMR and NOE experiments. In addition, 3-O-acetoacetyl lupeol, a novel triterpene ester, the triterpene O-acetyl aleuritolic acid and long chain esters of E-ferulic acid with C24-, C26- and

C28-alcohols were also isolated and characterized by spectroscopic methods.

9205-3089 Addae-Mensah, I., Achenbach, H., Thoithi, G.N., Waibel, R., Mwangi, J.W.(Department of Pharmacy, University of Nairobi, Nairobi, Kenya) **A new triterpenoid ester from *Croton megalocarpus*.** *Planta Medica*, v. 57(Supplement 2): p. A66-A67, 1991 (4 ref, Eng).

Fractionation of the petroleum ether extract of *C.megalocarpus* has yielded, among other constituents, two triterpene esters, acetoacetyl lupeol (1), which is a new compound, and 3beta-acetyloxy-D-olean-14-en-28-oic acid (O-acetylaleuritolic acid; (2), a rare triterpene ester. The structure of compounds 1 and 2 was deduced from the IR, mass, H and ¹³C-NMR spectra as well as various COSY 2D NMR measurements.

9205-3090 Adededeji, J., Hartman, T.G., Lech, J., Ho, C.T. (Department of Food Science and The Center for Advanced Food Technology, Cook College, New Jersey Agricultural Experiment Station, Rutgers, USA) **Characterization of glycosidically bound aroma compounds in the African mango, *Mangifera indica* L..** *Journal of Agricultural and Food Chemistry*, v. 40(4): p. 659-661, 1992 (36 ref, Eng).

Glycosidically bound volatile constituents of the African mango (*Mangifera indica*) were characterized. Isolation and separation of components were accomplished by adsorption on a nonionic resin Amberlite XAD-2 by column chromatography and elution by various selective solvents. Aglycons from the volatile components from the glycosidically bound fraction were released by enzymatic hydrolysis with almond beta-glycosidase. Volatile components from the glycosidically bound fraction were analyzed by gas chromatography(GC), and gas chromatography-mass spectrometry (GC-MS). A total of 33 compounds were reported in the glycosidically bound fraction including 8 monoterpene alcohols, 5 aldehydes, 4 acids, 7 esters, and 5 C13 norisoprenoids.

9205-3091 Adeyeye, A.(Department of Science and Technology, The Polytechnic, Ibadan, Iree Campus, Iree, Osun State, Nigeria) **Studies on seed oils of *Garcinia kola* and *Calophyllum inophyllum*.** *Journal of the Science of Food and Agriculture*, v. 57(3): p. 441-442, 1991 (8 ref, Eng).

Characteristics of *Garcinia kola*(Bitter Kola) and *Calophyllum inophyllum* seed oils are presented. Both showed high degrees of unsaturation and high oil contents.

9205-3092 Adhikari, S.(Institute of Food Science and Technology, BCSIR, Dhaka, Bangladesh) **Studies on *Coriandrum sativum* Linn. Part II. Chemical investigation coriander seed oil.** *Bangladesh Journal of Scientific*

and *Industrial Research*, v. 26(1-4): p. 33-40, 1991 (20 ref, Eng).

After removing essential oil, a lipid fraction was extracted from *C.sativum* seeds and its physical and chemical characteristics were determined. The fatty acids composition of lipid was established by GLC and found to contain palmitic peteroselinic, oleic and linoleic acids. Lauric, myristic, myristoleic and palmitoleic acid were present in small amounts. The unsaponifiable matter were analysed for their sterol content by TLC and beta-sitosterol was found predominant.

9205-3093 Adhikary, S.R., Tuladhar, B.S., Sheak, A., van Beek, T.A., Posthumus, A., Lelyveld, G.P. (Royal Drug Research Laboratory, Thapathali, Kathmandu, Nepal) **Investigation of Nepalese essential oils. I. The oil of *Cinnamomum glaucescens* (Sugandha kokila).** *Journal of Essential Oil Research*, v. 4(2): p. 151-159, 1992 (11 ref, Eng).

The commercially available essential oil of *Cinnamomum glaucescens* fruits, was investigated by various physico-chemical, chromatographic and spectroscopic methods. Both the total fruit (incl. seed) oil and the pericarp oil obtained by steam- and hydrodistillation of Nepalese fruits were examined. Major components of the total oil were 1,8-cineole (13 percent), methyl cinnamate (14 percent), alpha-terpineol (7 percent) and many mono- and sesquiterpene hydrocarbons. The pericarp oil consisted mainly of 1,8-cineole (56 percent) and alpha-terpineol (10 percent). Minor amounts of monoterpene hydrocarbons, other monoterpene alcohols and methyl cinnamate were also present.

9205-3094 Adnan, A.Z., Pachaly, P., Arbain, D., Syafrudin (Department of Pharmacy, Andalas University, Campus FMIPA-UNAND, Air Tawar Padang, Indonesia) **An aporphine alkaloid from *Actinodaphne sesquipedalis*.** *Planta Medica*, v. 57(Supplement 2): p. A93, 1991 (6 ref, Eng).

Actinodaphnine, an aporphine alkaloid, has been isolated from the methanol extracts of the bark of *A.sesquipedalis* and identified.

9205-3095 Aguilar, M.I., Espejo, O., Camacho, D. (Departamento de Farmacia, Division de Bioquímica y Farmacia, Facultad de Química, UNAM, 04510 Mexico, D.F) **Chemical constituents of *Aristolochia grandiflora*.** *Fitoterapia*, v. 63(3): p. 275, 1992 (3 ref, Eng).

A mixture of fatty acids, beta-sitosterol and N-2-(4-hydroxyphenyl)-ethylcoumaramide have been isolated from the aerial parts of the plant and identified.

9205-3096 Ahmad, R., Sheikh, T.N., Ahmad, A., Ahmad, M. (ACR Centre, PCSIR Laboratories Complex, Lahore, Pakistan) **The essential oils.** *Hamdard Medicus*, v. 35(1): p. 94-110, 1992 (32 ref, Eng).

Chemistry of essential oils, their origin, location and function in plants have been discussed.

9205-3097 Ahmad, R., Malik, M.A., Zia-ul-Haq, M. (Department of Chemistry, Quaid-i-Azam University, Islamabad, Pakistan) **Alkaloids of *Cissampelos pareira*.** *Fitoterapia*, v. 63(3): p. 282, 1992 (26 ref, Eng).

Laudanosine, nuciferine, bulbocarpine, corytuberine and magnoflorine as hydrochloride have been isolated from the leaves and stems of *C.pareira*.

9205-3098 Ahmad, V.U., Saba, N., Perveen, S. (H E J Research Institute of Chemistry, University of Karachi, Karachi 75270, Pakistan) **Structure of guaianin M from *Guaiacum officinale*.** *Fitoterapia*, v. 63(3): p. 226-229, 1992 (7 ref, Eng).

A new saponin guaianin M was isolated from *G.officinale* and its structure was determined as 3-O-beta-D-glucopyranosyl-(1-2)-alpha-L-arabinopyranosyl-30-norolean-12, 20(29)-diene-28-oic acid. The known Akebia saponin PE was also isolated for the first time from this plant.

9205-3099 Akihisa, T., Hayashi, Y., Patterson, G.W., Shimizu, N., Tamura, T. (College of Science and Technology, Nihon University, 1-8, Kanda Surugadai, Chiyoda-ku, Tokyo 101, Japan) **4alpha-methylvernosterol and other sterols from *Vernonia anthelmintica* seeds.** *Phytochemistry*, v. 31(5): p. 1759-1763, 1992 (22 ref, Eng).

A novel 4alpha-methylsterol isolated from the seeds of *V.anthelmintica* was shown to have the structure 4alpha-methyl-5alpha-stigmasta-8,14,24(24')Z-trien-3beta-ol (4alpha-methylvernosterol) based on spectroscopic methods. The 4-demethylsterol and 4,4dimethylsterol fractions from the seed material were also investigated. The 4-demethylsterol fraction contained 5alpha-stigmasta-8,14,24(24')Z-trien-3beta-ol (vernosterol) and 5alpha-stigmasta-7,24(24')Z-dien-3beta-ol (avenasterol) as the dominant sterols. 4alpha-Methylvernosterol is the possible intermediate in the biosynthesis of vernosterol in *V.anthelmintica* seeds.

9205-3100 Al-Hazimi, H.M.G., Basha, R.M.Y. (Department of Chemistry, King Saud University, PO Box 2455, Riyadh 11451, Saudi Arabia) **Phenolic compounds from various *Artemisia* species.** *Journal of the Chemical Society of Pakistan*, v. 13(4): p. 277-289, 1991 (125 ref, Eng).

The species of the genus *Artemisia* are rich in sesquiterpenoid as well as phenolic compounds (flavonoids and coumarins). A review of the flavonoids and coumarins occurring in various *Artemisia* species has been tabulated.

9205-3101 Aladesanmi, A.J., Hoffmann, J.J. (Department of Pharmacognosy, Faculty of Pharmacy, Obafemi Awolowo University, Ile-Ife, Nigeria) **Unusual homoerythrina alkaloids from the stem of *Dysoxylum lenticellare*. *Planta Medica*, v. 57(Supplement 2); p. A94, 1991 (4 ref, Eng).**

Three alkaloids with an unusual oxygenation pattern have been isolated from the stem of *D.lenticellare* and characterized.

9205-3102 Alfonso, D., Bernardinelli, G. (Laboratoire de Pharmacognosie, Université de Genève, Sciences II, 30, quai Ernest-Ansermet, CH-1211 Genève 4, Switzerland) **New withanolides from *Ioichroma coccineum*. *Planta Medica*, v. 57(Supplement 2); p. A67, 1991 (6 ref, Eng).**

From *Ioichroma coccineum* five withanolides withaferine A(1), withacnistine (2), and three new compounds: the (17R,20S,22R)-4 β -hydroxy-1-oxo-5 β ,6 β -epoxy-16 α -acetoxyl witha-2,24-dienolide, named ioichromolide (3), the 24,25-dihydrowithacnistine(4), and the 24,25-dihydroioichromolide(5) were isolated. Compounds 3 and 5 are the first known examples of 16-acetoxyl withanolides. Compounds 1 and 2 were identified by comparison with earlier reported data. The structures of 3,4, and 5 were deduced on the basis of NMR (¹H, ¹³C and ¹H-¹³C heteronuclear shift correlation), UV, and mass spectral comparison with 1,2, and known 24,25-dihydrowithanolides(5), and the position of the acetoxyl group was established unambiguously by X-ray crystallography of 3.

9205-3103 Ali, M. (Faculty of Pharmacy, Hamdard University, Hamdard Nagar, New Delhi 110062, India) **Neo-clerodane diterpenoids from *Musa balbisiana* seeds. *Phytochemistry*, v. 31(6); p. 2173-2175, 1992 (7 ref, Eng).**

Three neo-clerodane diterpenoids, musabalbisianes A-C, have been isolated as new constituents from the seeds of *M.balbisiana*. Their structures have been established by a combination of spectroscopic analysis and chemical conversions.

9205-3104 Ali, M., Bhutani, K.K. (Faculty of Pharmacy, Jamia Hamdard (Hamdard University), Hamdard Nagar, New Delhi 110 062, India) **Alihirsutine A, a new phenanthroquinolidine alkaloid from *Tylophora hirsuta*. *Fitoterapia*, v. 63(3); p. 243-244, 1992 (Eng).**

From the aerial parts of *T.hirsuta* a new phenanthroquinolidine alkaloid, alihirsutine A, was isolated and characterized by chemical and spectral means.

9205-3105 Ali, M.S., Hye, M.A., Mondal, M.I.H., Rahman, M.A. (BCSIR Laboratories, Rajshahi, Bangladesh) **Extractions of catechu from different layers of the stem of *Acacia catechu* tree. *Bangladesh Journal of Scientific and Industrial Research*, v. 26(1-4); p. 171-174, 1991 (4 ref, Eng).**

To ascertain the presence of catechu in different layers of *A.catechu* tree, a portion of stem was subdivided into four layers namely outer most bark, inner bark, sap wood and red heart wood. The first three layers contained substantial amount of catechu compared with that present in the red heart wood of the *A.catechu*. The results indicate the presence of catechu not only in the red heart wood but also in other layers.

9205-3106 Ansari, S.H., Ali, M., Qadry, J.S. (Faculty of Pharmacy, Jamia Hamdard, New Delhi 110 062, India) **Chromatographic analysis of oil from *Pistacia integerrima* Gall. *Indian Journal of Natural Products*, v. 7(2); p. 15-16, 1991 (7 ref, Eng).**

The essential oil of the galls of *P.integerrima* stem subjected to TLC and GLC analysis, was found to be rich in α -pinene, β -pinene, α -phellandrene and δ^3 -carene. The other constituents were β -phellandrene, γ -pinene, γ -terpinene, limonene, α - and β -terpineol and α - and β -ocimene.

9205-3107 Aquino, R., Ciavatta, M.L., De Tommasi, N., Gacs-Baitz, E. (Dipartimento di Chimica delle Sostanze naturali, Università di Napoli "Federico II", via D. Montesano 49, 80131 Napoli, Italy) **Tetranorditerpenes from *Detarium microcarpum*. *Phytochemistry*, v. 31(5); p. 1823-1825, 1992 (8 ref, Eng).**

The chloroform extract of *Detarium microcarpum* afforded two tetranorditerpenes, 1-naphthaleneacetic-5-carboxy-1,2,3,4,4a,7,8,8a-octahydro-1,2,4a-trimethyl acid and 1-naphthaleneacetic-7-oxo-1,2,3,4,4a,7,8,8a-octahydro-1,2,4a,5-tetramethyl acid, together with a clerodane diterpene, 2-oxo-kolavenic acid. New spectroscopic data are reported for the two rare tetranorditerpenes.

9205-3108 Ara, I., Siddiqui, B.S., Faizi, S., Siddiqui, S. (H E J Research Institute of Chemistry, University of Karachi, Karachi 32, Pakistan) **Isolation and structure elucidation of the triterpene azadirinin from the root of *Azadirachta indica*. *Fitoterapia*, v. 63(2); p. 118-121, 1992 (4 ref, Eng).**

From the root bark of *A.indica* a new triterpene, azadirinin (C₃₉H₄₆O₁₀) has been isolated and its structure elucidated by spectroscopic methods.

9205-3109 Atta-ur-Rahman, Bhatti, M.K. , Choudhary, M.I., Sener, B.(HEJ Research Institute of Chemistry, University of Karachi, Karachi 75270, Pakistan) **Chemical constituents of *Fumaria indica*. *Fitoterapia*, v. 63(2): p. 129-135, 1992 (17 ref, Eng).**

A new secophthalideisoquinoline alkaloid, papracine, along with six known alkaloids, oxyhydrastinine, noroxyhydrastinine, fumaramine, stylophine, bisnorargemonine and fumaritine, have been isolated for the first time from *F.indica*. Another known base beta-hydrastine was also isolated and X-ray diffraction studies were carried out.

9205-3110 Attar-ur-Rahman, Ahmad, H.(H E J Research Institute of Chemistry, University of Karachi, Karachi 75270, Pakistan) **An aporphine-benzylisoquinoline alkaloid from *Berberis waziristanica*. *Phytochemistry*, v. 31(5): p. 1835-1836, 1992 (9 ref, Eng).**

A new dimer, waziristanine, has been isolated from the root bark of *Berberis waziristanica*. Other alkaloids present were pakistanine and aromoline which are also previously unknown from this species.

9205-3111 Auger, J., Boscher, J., Lages, E. , Postaire, E., Viel, C.(IBEAS, URA CNRS 1298, Universite F. Rabelais, Parc de Grandmont, Avenue Mouge, F37200 Tours, France) **(Differences and similarities in the composition of the two species of *Allium*: *Allium vineale* L. and *Allium ursinum* L.). *Bulletin de la Societe Botanique de France, Lettres Botaniques*, v. 139(1): p. 61-66, 1992 (16 ref, Fre, Eng).**

Sulfur volatiles determined by gas chromatography and mass spectrometry analyses have been found to be the same in the two species, viz., *A.vineale* and *A.ursinum*. Both species possess the four moieties methyl, propyl, allyl and 1-propenyl.

9205-3112 Baaliouamer, A., Meklati, B.Y. , Fraisse, D., Scharff, C.(Universite des Sciences et de la Technologie Houari Boumedienne Institut de Chimie El-Alia B.P. 32, Bab-Ezzouar, Alger, Algeria) **The chemical composition of some cold-pressed citrus oils produced in Algeria. *Journal of Essential Oil Research*, v. 4(3): p. 251-258, 1992 (34 ref, Eng).**

The cold-pressed oils of five orange cultivars, a Tangor hybrid and the Clementine Tangerine, were examined by GC/MS. The orange oils were found to contain the following number of constituents: Washington-Navel (43),

Portuguese (61), Valencia (43), Hamlin (24) and Sanguine (23). The Tangor hybrid oil was found to contain 34 components, while 25 components were found in the Clementine oil. The use of preparative GC as a method to remove the monoterpene hydrocarbons prior to GC/MS analysis was demonstrated.

9205-3113 Baas, W.J., Van Berkel, I.E.M. , Versluis, C., Heerma, W., Kreyenbroek, M.N.(University of Utrecht, Department of Plant Ecology and Evolutionary Biology, Ecophysiology Group, Sorbonnelaan 16,3584 CA Utrecht, The Netherlands) **Ring-A fissioned 3,4-seco-3-nor-triterpene-2-aldehydes and related pentacyclic triterpenoids from the leaf wax of *Hoya australis*. *Phytochemistry*, v. 31(6): p. 2073-2078, 1992 (7 ref, Eng).**

The leaf wax of *H.australis* has been shown to contain a series of new 3,4-seco-3-nor-triterpene-2-aldehydes (proposed names australinals A-D), the related 3,4-seco-3-nor-2-ol derivatives (australinols A-D) and their precursors, the non-fissioned pentacyclic triterpenols delta-amyrin, beta-amyrin, lupeol and alpha-amyrin. Minor amounts of psi-taraxasterol and taraxasterol-derived compounds were also present (australinals E and F, and australinols E and F) as well as traces of methylated 3,4-seco-3-acid derivatives of beta- and delta-amyrin. Structure of australinol B has been revised to a 2-ol derivative. Australinals A-F, australinols A, C-F and methyl-dihydroaustralinoate have not been described from living plants before.

9205-3114 Baniias, C., Oreopoulou, V. , Thomopoulos, C.D. (Department of Chemical Engineering, National Technical University of Athens, GR 15700 Athens, Greece) **Effect of primary antioxidants and synergists on the activity of plant extracts in lard. *Journal of American Oil Chemists' Society*, v. 69(6): p. 520-524, 1992 (8 ref, Eng).**

Antioxidant activity of combinations of plant extracts and primary antioxidants or citric acid were studied in lard stored at 75 degrees. Methanol extracts of oregano, thyme, marjoram, dittany, rosemary and sage were used. When combined with butylated hydroxyanisole, butylated hydroxytoluene or ascorbyl palmitate the extracts showed an additive antioxidant effect. Citric acid showed high synergetic effect with marjoram, minor-effect with thyme extract, but it had negative effect with all others.

9205-3115 Barbakadze, V., Kemertelidze, E. , Dekanosidze, H., Beruchashvili, T., Usov, A.(Institute of Pharmacochimistry, Academy of Sciences of the Republic of Georgia, Tbilisi 380059, USSR) **Isolation and structural investigation of a glucofructan from *Symphytum caucasicum*. *Planta Medica*, v. 57(Supplement 2): p. A33, 1991 (4 ref, Eng).**

Hot water extraction of roots, stems, or leaves of *S. caucasicum* afforded water-soluble polysaccharides in yields of 16.6, 8.0, and 7.1 percent respectively, based on dry biomass. According to the fractionation and monosaccharide composition data, all three preparations contain a neutral glucofructan and an acidic arabinogalactan. The root glucofructan was isolated by chromatography on a DEAE-cellulose column, and a small amount of starch was removed by amylolysis. The structure of the purified polysaccharide was also studied.

9205-3116 Barrero, A.F., Sanchez, J.F., Altarejos, J., Zafra, M.J. (Departamento de Quimica Organica, Facultad de Ciencias, Universidad de Granada 18071 Granada, Spain) **Homoditerpenes from the essential oil of *Tanacetum annuum***. *Phytochemistry*, v. 31(5): p. 1727-1730, 1992 (8 ref, Eng).

An investigation of the essential oil from the flowers of *T. annuum* led to the identification of 43 components, two of them having a homoditerpene skeleton. Five of these substances are new natural products.

9205-3117 Baser, K.H.C., Ozek, T., Kurkcuoglu, M., Tumen, G. (Anadolu University, Medicinal Plants Research Centre 26470 Eskisehir, Turkey) **Composition of the essential oil of *Origanum sipyleum* of Turkish origin**. *Journal of Essential Oil Research*, v. 4(2): p. 139-142, 1992 (14 ref, Eng).

Origanum sipyleum syn. (*Majorana sipylea*). The volatile oil of each sample was obtained by hydrodistillation and analyzed by GC and GC/MS. Forty-eight compounds were identified in the oils of which gamma-terpinene (10.80-26.60 percent), p-cymene (3.76-36.60 percent), thymol methyl ether (trace-19.90 percent), carvacrol methyl ether (0.41-10.20 percent), thymol (0.23-7.30 percent) and carvacrol (0.82-12.20 percent) were found to both occur in greatest abundance and to vary the greatest.

9205-3118 Baser, K.H.C., Kurkcuoglu, M., Ozek, T. (Anadolu University Medicinal Plants Research Centre, (TBAM) 26470 Eskisehir, Turkey) **Composition of the Turkish cumin seed oil**. *Journal of Essential Oil Research*, v. 4(2): p. 133-138, 1992 (9 ref, Eng).

The steam and water distilled oils of Turkish cumin seed (*Cuminum cyminum*) were examined by a combination of GC and GC/MS. The major compounds characterized in the oils were cuminaldehyde (19.25-27.02 percent), p-mentha-1,3-dien-7-al (4.29-12.26 percent), p-mentha-1,4-dien-7-al (24.48-44.91 percent), gamma-terpinene 7.06-14.10 percent, p-cymene (4.61-12.01 percent) and beta-pinene (2.98-8.90 percent). The mode of distillation and pregrinding of the cumin seed had a pronounced effect

on the composition of the resultant oil. The composition of the lab-distilled oils was compared with some commercially produced Turkish cumin seed oil, some Indian oils and Egyptian oil. They were found to differ in their cuminaldehyde and p-menthadienal contents.

9205-3119 Bashir, A., Hamburger, M., Msonthi, J.D., Hostettmann, K. (Institut de Pharmacognosie et Phytochimie, University de Lausanne, BEP, CH-1015 Lausanne, Switzerland) **Isoflavones and xanthenes from the roots of *Polygala virgata***. *Planta Medica*, v. 57(Supplement 2): p. A112, 1991 (5 ref, Eng).

Two xanthenes and three isoflavones have been isolated from the roots and identified.

9205-3120 Bauer, R., Redl, K., Davis, B.* (Institut für Pharmazeutische Biologie, Universität München, Karlstr. 29, D-8000 München 2, Germany) **Four polyacetylene glucosides from *Bidens campylotheca***. *Phytochemistry*, v. 31(6): p. 2035-2037, 1992 (12 ref, Eng).

Four new polyacetylene glucosides beta-2-O-D-glucosyltrideca-3E,11E-dien-5,7,9-triyn-1,2,13-triol; 2-O-beta-D-glucosyltrideca-3E,11E-dien-5,7,9-triyn-1,2-diol; 2-O-beta-D-glucosyltrideca-3E,11Z-dien-5,7,9-triyn-1,2-diol and 2-O-beta-D-glucosyltrideca-11E-en-3,5,7,9-tetrayn-1,2-diol have been isolated from the aerial parts of *B. campylotheca*. The structures were determined by means of UV, MS, ¹H NMR, ¹³C NMR and COSY-NMR.

9205-3121 Baumgartner, B., Erdelmeier, C.A.J., Rali, T., Sticher, O. (Department of Pharmacy, Swiss Federal Institute of Technology (ETH) Zurich, CH-8092 Zurich, Switzerland) **Flavonoid glycosides from the leaves of *Ficus adenosperma***. *Planta Medica*, v. 57(Supplement 2): p. A112-A113, 1991 (2 ref, Eng).

A methanolic extract of leaves was prefractionated over Sephadex LH-20 to afford two fractions I and II. Fraction II displayed significant antiproliferative activity when tested in the in vitro mice keratinocyte MK cell lines. HPLC analyses with on-line UV detection indicated that the active fraction II contained flavonoids as the major constituents. Out of six flavonoids identified in the extract three are new. Tested in the in vitro mice keratinocyte MK cell lines, the isolated flavonoids showed, however, no significant activity.

9205-3122 Bestmann, H.J., Rauscher, J., Vostrowsky, O., Pant, A.K., Vasu Dev, Parihar, R., Mathela, C.S. (Chemistry Department, D S B Campus, Kumaun University, Nainital, UP, India) **Constituents of the essential oil of *Elsholtzia blanda* Benth (Labiatae)**. *Journal of Essential Oil Research*, v. 4(2): p. 121-124, 1992 (9 ref, Eng).

The essential oil of *Elsholtzia blanda* collected from Jorhat has been analyzed by GC, GC/MS, GC/FTIR, IR, ¹H- and ¹³C-NMR spectroscopy. Geranyl acetate was found to be the major constituent (71 percent). Twenty-eight other components were also characterized in the oil with linalool (5.27 percent), geraniol (3.77 percent), (E)-beta-ocimene (2.96 percent), beta-caryophyllene (1.75 percent), alpha-bergamotene (1.70 percent), (Z)-beta-ocimene (1.38 percent), acetophenone (1.13 percent) and linalyl acetate (1.11 percent) being the next most abundant compounds.

9205-3123 Bhakuni, R.S., Shukla, Y.N., Thakur, R.S. (Central Institute of Medicinal and Aromatic Plants, Lucknow 226 016, UP, India) **Phytoconstituents of *Melochia* species: a review.** *Indian Drugs*, v. 29(7): p. 292-298, 1992 (25 ref, Eng).

Various phytoconstituents viz., alkaloids, flavonoids, coumarins, triterpenoids and steroids, representing a variety of chemical structures isolated from four *Melochia* species are reported. The biological activities of plant extracts or active constituents have also been reviewed.

9205-3124 Blazevic, N., Kalodera, Z., Petricic, J., Plazibat, M. (Chromos-Aroma, Zagreb, Yugoslavia) **Essential oil content and composition of *Teucrium arduini* L.** *Journal of Essential Oil Research*, v. 4(3): p. 223-225, 1992 (7 ref, Eng).

The samples of plant material of *T. arduini* which were collected in 1989 and 1990 were hydrodistilled to produce oil yields of 0.07 percent and 0.18 percent (v/w) respectively. GC and GC/MS analysis revealed that germacrene D (23.4 percent and 57.8 percent) and beta-caryophyllene (17.3 percent and 13.5 percent) were the main components of the oils.

9205-3125 Boland, D.J., Brophy, J.J.*, Fookes, C.J.R. (University of New South Wales, PO Box 1 Kensington, NSW 2033, Australia) **Jensenone, a ketone from *Eucalyptus jensenii*.** *Phytochemistry*, v. 31(6): p. 2178-2179, 1992 (9 ref, Eng).

Jensenone, 4,6-diformyl-2-isopentanoyl-phloroglucinol, has been isolated from the steam volatile leaf oil of *E. jensenii*. It comprises approximately 70 percent of the oil. Also present in the oil were small quantities of over 60 mono- and sesquiterpenes.

9205-3126 Bosnic, T., Grujic-Vasic, J. (Faculty of Pharmacy, University of Sarajevo, Mose Pijade 6, 71000 Sarajevo, Yugoslavia) **Investigation of tannins from *Chrysosplenium alternifolium*.** *Planta Medica*, v. 57(Supplement 2): p. A113-A114, 1991 (9 ref, Eng).

Tannin content of leaves (2.3-3.2 percent), flowers (1.7-2.5 percent) and whole herb (1-2.3 percent) of *C. alternifolium* has been estimated. The type of tannin has also been confirmed by thermofractographic analysis. Catechin tannins were identified in the aerial parts of the plant.

9205-3127 Bringmann, G., Schneider, Ch., Ake Assi, L. (Institute of Organic Chemistry, University of Wurzburg, Am Hubland, D-8700 Wurzburg, Federal Republic of Germany) **Direct and modified bicyclic moieties of naphthylisoquinoline alkaloids from *Ancistrocladus barteri*: First biosynthetic indicators.** *Planta Medica*, v. 57(Supplement 2): p. A10, 1991 (5 ref, Eng).

The isolation of bicyclic "molecular moieties" or their analogues from *A. barteri* has been described. The structure of molecular moiety was established by spectroscopic and degradative methods, and finally confirmed by total synthesis. The isolation is in agreement with the assumption that both molecular moieties are entirely built up before the aryl coupling step to the complete alkaloid takes place.

9205-3128 Bringmann, G., Ortmann, T., Rubenacker, M., Ake Assi, L. (Institute of Organic Chemistry, University of Wurzburg, Am Hubland, D-8700 Wurzburg, Federal Republic of Germany) **An unusual 4-methoxylated naphthylisoquinoline alkaloid from the leaves of *Triphyophyllum peltatum*.** *Planta Medica*, v. 57(Supplement 2): p. A96, 1991 (5 ref, Eng).

A fully aromatic naphthylisoquinoline (mp 177-79 degree), has been isolated from the roots of *T. peltatum* and characterized. This alkaloid is the first representative of a class of alkaloids that has an addition methoxy group at C-4.

9205-3129 Bringmann, G., Zagst, R., Ake Assi, L. (Institute of Organic Chemistry, University of Wurzburg, Am Hubland, D-8700 Wurzburg, Federal Republic of Germany) **Ancistrobrevine B: A naphthylisoquinoline alkaloid with a novel coupling type from *Ancistrocladus abbreviatus*.** *Planta Medica*, v. 57(Supplement 2): p. A96-A97, 1991 (4 ref, Eng).

Isolation and structure elucidation of ancistrobrevine B, whose structure is based on a novel 5,8'-coupling type, has been described.

9205-3130 Burton, S.G., Kaye, P.T. (Department of Chemistry, Rhodes University, P O Box 94, Grahamstown, 6140, Republic of South Africa) **Isolation and characterisation of sulphur compounds from *Tulbaghia violacea*.** *Planta Medica*, v. 58(3): p. 295-296, 1992 (10 ref, Eng).

The isolation and characterisation of two sulphur compounds namely dialkyl sulphone and its known

deoxygenated analogue from fresh, green parts of *T.violacea* has been reported.

9205-3131 Campbell, W.E., Dlova, M.C., Makhesha, P.A., Paterson, F.W. (Department of Chemistry, University of Cape Town, Rondebosch 7700, South Africa) **Alkaloids from *Cybistetes longifolia***. *Planta Medica*, v. 58(3): p. 299, 1992 (8 ref, Eng).

The alkaloids, 6-hydroxycrinamine, lycorine, and pseudolycorine were isolated and identified by a comparison of their melting points and ¹H-NMR and mass spectra with those published in the literature. All three compounds isolated from *C.longifolia*, are known to have demonstrated antineoplastic activity.

9205-3132 Canigüeral, S., Serra, M., Vila, R., Adzet, T. (Unitat de Farmacologia i Farmacognosia, Facultat de Farmacia, Universitat de Barcelona. Av. Diagonal 643, E-08028 Barcelona, Spain) **Polyphenol glycosides from *Quinchamalium chilense***. *Planta Medica*, v. 57(Supplement 2): p. A114-A115, 1991 (1 ref, Eng).

From aqueous extract of *Q.chilense* aerial parts two unusual polyphenol glycosides phlorin and aequinetin as well as rutin were isolated and identified.

9205-3133 Carreiras, M.C., Nascimento, J. (Faculdade de Farmacia da Universidade de Lisboa (CECF-INIC), Av. das Forças armadas, 1699 Lisboa Codex, Portugal) **Flavones from *Teucrium algarbiense***. *Fitoterapia*, v. 63(3): p. 277-278, 1992 (12 ref, Eng).

5,4',-Dihydroxy-6,7-dimethoxyflavone (cirsimaritin) and 5,3',4'-trihydroxy-6,7-dimethoxyflavone (cirsiliol) have been isolated from the aerial parts of *T.algarbiense* and identified.

9205-3134 Cessna, A.J. (Agriculture Canada Research Station, Regina, Saskatchewan, Canada S4P 3A2) **Residues of triallate in garlic (*Allium sativum* L.) cloves following preplant incorporation**. *Canadian Journal of Plant Science*, v. 71(4): p. 1257-1261, 1991 (13 ref, Eng, Frc).

In a 2 year study, gas chromatography was used to determine the presence of residues of the herbicide triallate in the cloves of cured garlic *A.sativum* bulbs following preplant incorporation of triallate at 2.2 kg ha⁻¹. Triallate residues were not detected in the cloves of mature bulbs in either year. Recoveries of triallate were 82.1 ± 6.9 percent and 93.8 ± 4.9 percent from garlic clove tissue fortified at 0.1 and 0.02 mg kg⁻¹, respectively.

9205-3135 Chandra, A., Nair, G., Iezzoni, A. (Bioactive Natural Products Laboratory, Department of Horticulture, Michigan State University, East Lansing, Michigan 48824,

USA) **Evaluation and characterization of the anthocyanin pigments in tart cherries (*Prunus cerasus* L.)**. *Journal of Agricultural and Food Chemistry*, v. 40(6): p. 967-969, 1992 (13 ref, Eng).

A novel method has been developed for the extraction, isolation, and separation of the anthocyanins in tart cherry (*P.cerasus*) cultivars. The presence of cyanidin 3-sophoroside, cyanidin 3-glucosylrutinoside, cyanidin 3-glucoside, and cyanidin 3-rutinoside was confirmed in Montmorency, English Morello, and three Michigan State University hybrids. Also, peonidin 3-galactoside is reported for the first time to be one of the color pigments present in tart cherries. A higher level of anthocyanins is shown in all the hybrid selections studied.

9205-3136 Charles, D.J., Simon, J.E. (Department of Horticulture, Purdue University, West Lafayette, IN 47907, USA) **A new geraniol chemotype of *Ocimum gratissimum* L.** *Journal of Essential Oil Research*, v. 4(3): p. 231-234, 1992 (1 ref, Eng).

The essential oils which were obtained from the leaves, flowers and stems of *O.gratissimum* in concentrations of 1.34 percent, 1.49 percent and 0.14 percent respectively, were examined by GC/MS. Fifteen constituents in the essential oil were identified with geraniol (83.7-88.8 percent) as the major constituent. Other major components included gamma-muurolene (1.58-3.88 percent), beta-caryophyllene (1.2-2.29 percent), neral (1.35-3.82 percent) and limonene (0.74-1.91 percent). Essential oil composition was similar among plant parts. Eugenol and thymol reported as the major constituent of Nigerian and Indian oil could not be detected in this oil. This is the first report of a geraniol-rich essential oil from *O.gratissimum*.

9205-3137 Charles, D.J., Simon, J.E. (Department of Horticulture, Purdue University, West Lafayette, IN 47907) **Essential oil constituents of *Ocimum kilimandscharicum* Guerke**. *Journal of Essential Oil Research*, v. 4(2): p. 125-128, 1992 (16 ref, Eng).

The volatile oil of *Ocimum kilimandscharicum*, a perennial undershrub grown in Indiana was analyzed by GC and GC/MS. The essential oil content varied between the leaves (0.77-1.12 percent dry wt. basis) and the flowers (1.96-2.8 percent dry wt. basis). Seventeen constituents were identified in the oil. Oil composition was similar between the leaves and flowers with linalool as the major constituent (leaves (41.94 percent), flowers (58.85 percent)). Other major constituents included camphor (leaves (17.02 percent), flowers (15.82 percent)) and 1,8-cineole (leaves (10.18 percent), flowers (6.38 percent)).

9205-3138 Charrouf, Z., Wieruszeski, J.M., Fkih-Tetouani, S., Leroy, Y., Charrouf, M., Fournet, B. (Laboratoire de Chimie des Plantes, Faculté des Sciences, BP 1014 Rabat, Morocco) **Triterpenoid saponins from *Argania spinosa*.** *Phytochemistry*, v. 31(6): p. 2079-2086, 1992 (19 ref, Eng).

Five new oleanane saponins named arganine A, B, D, E and F and two known saponins: arganine C and mi-saponin A were isolated from the kernel of *A. spinosa*. The structures of these saponins were elucidated by using ¹H NMR, ¹H-¹H COSY NMR, ¹³C NMR, FAB mass spectrometry and chemical evidence.

9205-3139 Charrouf, Z., Fkih-Tetouani, S., Charrouf, M., Mouchel, B. (Laboratoire de Chimie des Plantes, Faculté des Sciences, BP 1014 Rabat RP Morocco) **Triterpenes and sterols extracted from the pulp of *Argania spinosa* (L.) Sapotaceae.** *Plantes Medicinales et Phytotherapie*, v. 25(2-3): p. 112-117, 1991 (9 ref, Eng, Fre).

Triterpenic alcoholic and sterols were isolated from the unsaponifiable fraction of the pulp lipid extract of *A. spinosa*. Their structures were elucidated by the usual techniques. These compounds are erythrodiol, lupeol, beta- and alpha- amyrine and alpha-spinasterol, schottenol and betulinaldehyde.

9205-3140 Chen, H.S., Liang, H.Q., Liao, S.X. (School of Pharmacy, Second Military Medical University, Shanghai 200 433, China) **Studies on the chemical constituents of the root of *Cocculus trilobus* DC.** *Acta Pharmaceutica Sinica*, v. 26(10): p. 755-758, 1991 (5 ref, Chi, Eng).

Four bisbenzylisoquinoline alkaloids (I-IV) have been isolated from the roots of (*C. trilobus*) growing wild in the mountainous areas of Zhejiang province. Their structures were established as isotrilobine (I), trilobine (II), isotrilobine-N-2-oxide (III) and nortrilobine (IV) on the basis of spectral analysis, physico-chemical constants and properties of the derivatives. III is a new alkaloid and IV was found from this plant for the first time.

9205-3141 Chen, Y.Z., Wu, Q.J., Xu, B.J., Lou, F.C., Ding, L.S. (Fujian Institute of Research on the Structure of Matter, Academia Sinica, 350002, Fuzhou, Fujian, China) **Crystal structure of neo-aristolactone.** *Youji Huaxue*, v. 12(1): p. 54-57, 1992 (3 ref, Chi, Eng).

A new sesquiterpenoid lactone (C₁₅H₂₀O₂), has been isolated from the roots of *Aristolochia mollissima* and identified from HRMS. The structure of new lactone has been determined by using X-ray diffraction method.

9205-3142 Cheong Sing, A.S., Smadja, J. (Laboratoire de Chimie Organique, Université de la Réunion, 15 Avenue René Cassin, 97400 Ste-Clotilde, France) **Volatile con-**

stituents of faham (*Jumellea fragrans* (Thou.) Schltr.). *Journal of Agricultural and Food Chemistry*, v. 40(4): p. 642-646, 1992 (16 ref, Eng).

The volatile of faham leaves, a flavoring and medicinal plant of the Indian Ocean, have been analyzed by GC/MS. Besides the main compound, coumarin, 99 minor components were identified after enrichment with a preparative capillary chromatograph. The presence of diterpenes, kaurenes and phytadienes was confirmed using GC/FTIR. This study represents the first description of the volatile fraction of faham. A sensory evaluation of the leaves of faham used in rums and infusions is also given.

9205-3143 Cho, Y.K., Lee, M.W., Kang, H.M., Lee, H.K., Kang, S.S. (Department of Chemistry, Seoul Woman's University, Seoul 139-242, Korea) **Acylglucosyl sterols from the roots of *Caragana chamlagu*.** *Korean Journal of Pharmacognosy*, v. 23(1): p. 14-19, 1992 (12 ref, Kor, Eng).

A mixture of acylglucosyl sterols together with beta-sitosterol, beta-sitosterol 3beta-O-glucoside and fatty acids was isolated from the roots of *C. chamlagu* as their acetate forms and the structure elucidated by chemical and spectroscopic means. The major acylglucosyl sterol was beta-sitosteryl 3-O-{6'-O-oleoyl}-beta-D-glucopyranoside while the minor components were 6'-O-palmitoyl- and 6'-O-stearoyl-beta-D-glucosyl sitosterol congeners. The isolation and structure elucidation of these acylglucosyl sterols are reported for the first time from the genus *Caragana*.

9205-3144 Christov, V., Dutsnchewska, H., Kuzmanov, B. (Institut de Chimie Organique avec Centre de Phytochimie, Académie Bulgare des Sciences, 1113 Sofia, Bulgarie) **Quinolizidine alkaloids of Bulgarian species of the tribe Genisteae.** *Plantes Medicinales et Phytotherapie*, v. 25(2-3): p. 127-133, 1991 (15 ref, Eng, Fre).

Twelve quinolizidine alkaloids have been isolated from seven species of tribe Genisteae. The species were arranged on the basis of calculated oxydation and insaturation levels. A correlation between morphological characteristics of some species and their alkaloid content was established.

9205-3145 Colegate, S.M., Din, L.B., Ghisalberti, E.L., Latiff, A. (School of Veterinary Studies, Murdoch University, Murdoch, Western Australia 6150) **Tepanone, a retrochalcone from *Ellipeia cuneifolia*.** *Phytochemistry*, v. 31(6): p. 2123-2126, 1992 (13 ref, Eng).

Tepanone, (2E)-1-phenyl-3-(2-hydroxy-3,4,6-trimethoxyphenyl)prop-2-enone was isolated from roots and stem bark of *E. cuneifolia*. The structure was deduced

from spectroscopic data and confirmed by synthesis of the methylated derivative, methyltepanone. Methyltepanone exists as the two readily interconvertible trans and cis isomers.

9205-3146 Cordero, C.M., Serrano, A.M.G., Gonzalez, M.J.A. (Laboratoire de Pharmacognosie, Faculté de Pharmacie, Sor Gregoria de Santa Teresa, 41012 Seville, Spain) **Variations in the alkaloids of *Retama sphaerocarpa* Boissier.** *Plantes Medicinales et Phytotherapie*, v. 25(2-3): p. 157-160, 1991 (11 ref, Eng, Fre).

Six quinolizidine and one piperidine alkaloids were identified from four samples of the aerial parts of *R.sphaerocarpa*, collected at different seasons. Four alkaloids were found for the first time in this species. A qualitative variation of the alkaloidal content was found at different times of harvest.

9205-3147 Cui, B., Sakai, Y., Takeshita, T., Kinjo, J., Nohara, T. (Faculty of Pharmaceutical Sciences, Kumamoto University, Oe-honmachi 5-1, Kumamoto 862, Japan) **Four new oleanene derivatives from the seeds of *Astragalus complanatus*.** *Chemical & Pharmaceutical Bulletin*, v. 40(1): p. 136-138, 1992 (7 ref, Eng).

Four new methyl ester derivatives of oleanene glycosides were isolated from the seeds of *A.complanatus* together with two known triterpene glycosides, astragaloside VIII methyl ester and soyasaponin I methyl ester after treatment with diazomethane during separation procedure. The structures of these methyl ester derivatives were elucidated as 3-O- α -L-rhamnopyranosyl(1 to 2)- β -D-xylopyranosyl(1 to 2)-6-O-methyl- β -D-glucuronopyranosyl-soyasapogenol B 22-O- β -D-glucopyranoside, 3-O- α -L-rhamnopyranosyl(1 to 2)- β -D-galactopyranosyl(1 to 2)-6-O-methyl- β -D-glucuronopyranosyl-soyasapogenol B 22-O- β -D-glucopyranoside, 3-O- α -L-rhamnopyranosyl(1 to 2)- β -D-xylopyranosyl(1 to 2)-6-O-methyl- β -D-glucuronopyranosyl 3 β ,22 β ,24-trihydroxy-11-oxo-olean-12-ene and 3-O- α -L-rhamnopyranosyl(1 to 2)- β -D-galactopyranosyl(1 to 2)-6-O-methyl- β -D-glucuronopyranosyl 3 β ,22 β ,24-trihydroxy-11-oxo-olean-12-ene, respectively.

9205-3148 Cui, Z.H., Yuan, C.S. (Department of Pharmacognosy, School of Pharmacy, Beijing Medical University, Beijing 100 083, China) **Flavones of *Vaccinium uliginosum* fruits.** *Fitoterapia*, v. 63(3): p. 283, 1992 (7 ref, Eng).

Myricetin-5'-methyl ether, quercetin, and myricetin have been isolated from the berries of *V.uliginosum* and identified.

9205-3149 Dagne, E., Casser, I., Steglich, W. (Department of Chemistry, Addis Ababa University, PO Box 1176, Addis Ababa, Ethiopia) **Aloechryson, a dihydroanthracenone from *Aloe berhana*.** *Phytochemistry*, v. 31(5): p. 1791-1793, 1992 (12 ref, Eng).

Analysis of the roots of *A.berhana* resulted in the isolation of aloesaponol I, laccaic acid D methyl ester, aloesaponol III, aloesaponarin I, chrysophanol-8-methyl ether, chrysophanol, and the new dihydroanthracenone 3,4-dihydro-3,9-dihydroxy-8-methoxy-3-methyl-1(2H)-anthracenone named aloechryson.

9205-3150 Das, P., Joshi, P.C., Mandal, S., Das, A., Chatterjee, A., Banerjee, A. (Chemical Research Unit, CCRAS, Government of India, Calcutta, WB, India) **New coumarino-lignoids from *Hemidesmus indicus* R.Br.** *Indian Journal of Chemistry*, v. 31B(6): p. 342-345, 1992 (11 ref, Eng).

Two new coumarino-lignoids hemidesmin-1 and hemidesmin-2 have been isolated from the roots of *H.indicus* (Indian sarsaparilla) and the structures determined.

9205-3151 Daulatabad, C.D., Desai, V.A., Hosamani, K.M., Hiremath, V.B. (Department of Chemistry, Karnatak University, Dharwad 580003, India) **Epoxy oleic acid in quamodit seed oil.** *Journal of American Oil Chemists' Society*, v. 69(2): p. 190-191, 1992 (Eng).

Air-dried seeds of *Quamodit phenicea* and *Q.coccinea* powdered and extracted separately with light petroleum, afforded the following acids: palmitic (22.2-33.3 percent); stearic (11.3, 1.7 percent), oleic (13.5, 14.6 percent), linoleic (40.1, 30.8 percent), vernolic (12:13 epoxyoleic) (16.4, 10.2 percent), arachidic 3.5, 6.8 percent) and behenic (3.8, 2.6 percent) respectively. Epoxy acids exhibit co-carcinogenic activity.

9205-3152 Davies-Coleman, M.T., English, R.B., Rivett, D.E.A. (Department of Pharmaceutical Sciences, Rhodes University, Grahamstown, South Africa) **Bitter guaianolides from *Eriocephalus punctulatus*.** *Phytochemistry*, v. 31(6): p. 2165-2167, 1992 (8 ref, Eng).

A new, slightly bitter, 8-isobutyloxycumambrin-B, occurs in the leaves of *E.punctulatus* together with the intensely bitter cumambrin-A. Its structure has been confirmed by X-ray crystallography. L-2-O-Methylchiroinositol was also isolated.

9205-3153 De, B., Datta, P.C. (Department of Botany, Calcutta University, College of Science, Calcutta 700 019, WB, India) **Alkaloids in floral parts of *Strychnos nux-vomica*.** *Indian Journal of Natural Products*, v. 7(2): p. 19-20, 1991 (8 ref, Eng).

Strychnine, brucine, icajine, novacine and vomicine were detected in different floral parts of *S.nux-vomica*.

9205-3154 Delgado, G., Rios, M.Y., Colin, L., Garcia, P.E., Alvarez, L.(Instituto de Quimica de la Universidad Nacional Autonoma de Mexico, Ciudad Universitaria, Circuito Exterior, Coyoacan 04510, Mexico, D.F) **Constituents of *Borrchia frutescens*. *Fitoterapia*, v. 63(3): p. 273-274, 1992 (4 ref, Eng).**

Stigmastanol, stigmasterol, oleanolic acid and zoapatanolide A were isolated from the aerial parts of *B.frutescens*.

9205-3155 Dellacassa, E., Rossini, C., Menendez, P., Moyna, P., Verzera, A., Trozzi, A., Dugo, G.(Catedra de Farmacognosia y Productos Naturales, Facultad de Quimica, Universidad de la Republica Montevideo, Uruguay) **Citrus essential oils of Uruguay. Part I. Composition of oils of some varieties of mandarin. *Journal of Essential Oil Research*, v. 4(3): p. 265-272, 1992 (9 ref, Eng).**

Forty-five constituents were characterized in the oils with the limonene content varying from 75.26-96.23 percent. The composition and olfactory characteristics of these oils were compared with those of Italian mandarin oil and Uruguayan sweet orange oil. It was found that the "Ortanique" and "Ellendale" oils were very different from normal mandarin oil, with great similarity in composition and olfactory characteristics to sweet orange oil. The oil of "Malaquina" is also similar more to sweet orange oil than mandarin oil although it is quite rich in aliphatic aldehydes, particularly decanal. The oil of the cv. Malvasio has a composition which is between mandarin and sweet orange oils. The oil of cv. Comun is the only one found to possess olfactory and chemical characteristics similar to Italian mandarin oil.

9205-3156 Demizu, S., Kajiyama, K., Hiraga, Y., Kinoshita, K., Koyama, K., Takahashi, K., Tamura, Y., Okada, K., Kinoshita, T.(Meiji College of Pharmacy at Setagaya, 1-35-23 Nozawa, Setagaya-ku, Tokyo 154, Japan) **Prenylated dibenzolmethane derivatives from the root of *Glycyrrhiza inflata* (Xinjiang licorice). *Chemical & Pharmaceutical Bulletin*, v. 40(2): p. 392-395, 1992 (19 ref, Eng).**

Three dibenzoylmethanes were isolated from licorice of Xinjiang origin *G.inflata*, and their structures were elucidated spectroscopically as 1-(2,4-dihydroxy-5-prenylphenyl)-3-(4-hydroxyphenyl)-1,3-propanedione, 1-(2,4-dihydroxy-5-prenylphenyl)-3-(4-hydroxy-3-prenylphenyl)-1,3-propanedione; and 1-(2,4-dihydroxy-5-prenylphenyl)-3-(2,2-dimethyl-2H-1-benzopyran-6-yl)

-1,3-propanedione. The latter two constituents were new natural products, and were named glycyrdiones A (C₂₅H₂₈O₅ mp 67 degree) and B (C₂₅H₂₆O₅ mp 132 degree) respectively..

9205-3157 Ding, N., Yahara, S., Nohara, T.*(Faculty of Pharmaceutical Sciences, Kumamoto University, Oe-honmachi 5-1, Kumamoto 862, Japan) **Structure of mimengosides A and B, new triterpenoid glycosides from *Buddlejae Flos* produced in China. *Chemical & Pharmaceutical Bulletin*, v. 40(3): p. 780-782, 1992 (6 ref, Eng).**

Two new triterpenoid glycosides, named mimenosides A (1) and B (2), along with acteoside (3) were isolated from the *Buddlejae Flos* (flower and bud of *Buddleja officinalis*). The structures of 1 and 2 were determined as 3-O- α -L-rhamnopyranosyl-(1 to 4)- β -D-glucopyranosyl-(1 to 3)-{ β -D-glucopyranosyl-(1 to 2)- β -D-fucopyranoside of 16-dehydroxysaikogenin G and that of 3,23,28-trihydroxy-11-methoxy-olean-12-ene, respectively, by spectral and chemical methods..

9205-3158 Dixit, B.S., Srivastava, S.N.(National Botanical Research Institute, Lucknow, UP, India) **Flavonoids and carotenoids of *Cochlospermum vitifolium* flowers. *Fitoterapia*, v. 63(3): p. 270, 1992 (2 ref, Eng).**

Apigenin, naringenin, dihydroquercetin, beta-carotene, gamma-carotene, lycopene capsanthin and zeaxanthin have been isolated from *C.vitifolium* and identified.

9205-3159 Dixit, B.S., Srivastava, S.N.(National Botanical Research Institute, Lucknow, UP, India) **Flavonoids and carotenoids of *Tecoma argentea* flowers. *Fitoterapia*, v. 63(3): p. 272, 1992 (2 ref, Eng).**

Kaempferol, quercetin, luteolin, cyanidin-3-rutinoside, lycopene, capsanthin, beta-carotene and zeaxanthin have been isolated from *T.argentea* and identified.

9205-3160 Do, J.C., Yu, Y.J., Jung, K.Y., Son, K.H.(College of Pharmacy, Yeungnam University, Kyongsan 712749, Korea) **Flavonoids from the leaves of *Polygala japonica*. *Korean Journal of Pharmacognosy*, v. 23(1): p. 9-13, 1992 (8 ref, Eng).**

From the leaves of *P.japonica*, kaempferol, astragalin, kaempferol 3-O-(6"-O-acetyl)- β -D-glucopyranoside and kaempferol 3,7-di-O- β -D-glucopyranoside, were isolated and characterized by chemical and spectral means.

9205-3161 Dung, N.X., Phuong, D.L., Leclercq, P.A. (Departments of Technical Chemistry & Materia Medica, University of Hanoi, 19 Le Thanh Tong Street, Hanoi, Vietnam) **Trans-p-(1-butenyl)anisole: The main component in the leaf, stem and root oils of *Amomum schmidtii* Gagnep. from Vietnam.** *Journal of Essential Oil Research*, v. 4(3): p. 239-242, 1992 (7 ref, Eng).

The essential oils, which were obtained by steam distillation of the leaves, stem and roots of *A.schmidtii*, were analyzed by resolution GC and GC/MS, by IR and NMR spectrometry. It was found that the oils contained a high content (90-95 percent) of trans-p-(1-butenyl)anisole.

9205-3162 Durrresi, S., Rizo, P. (Faculty of Medicine, University of Tirana, Tirana, Albania) **Determination of the contents of morphine in the capsules of two varieties of Poppies grown in Albania.** *Planta Medica*, v. 57(Supplement 2): p. A100-A101, 1991 (4 ref, Eng).

The contents of morphine in the capsules of two varieties of poppy: the black variety (*Papaver somniferum* var. *nigrum* grown from local seeds (cultivar No.1) and a variety grown from imported seeds (cultivar No.2) which is a cross between the white variety (*Papaver somniferum* var. *album* and a form with violet-grey flowers were determined and compared. The capsules of cultivar No.1 contain almost twice as much morphine as those of cultivar No.2.

9205-3163 El-Sayed, N.H., Dooh, A.M., El-Khrisy, E.A.M., Mabry, T.J. (National Research Centre, Dokki, Cairo, Egypt) **Flavonoids of *Cassia italica*.** *Phytochemistry*, v. 31(6): p. 2187, 1992 (4 ref, Eng).

Ten flavonoids were isolated from aerial parts of *C.italica* including the first report of tamarixetin 3-rutinoside-7-rhamnoside.

9205-3164 Elgamal, M.H.A., Shalaby, N.M.M., Duddeck, H. (National Research Centre, Lab. of Natural Products, Dokki, Cairo, Egypt) **Constituents of *Cleome amblyocarpa*.** *Fitoterapia*, v. 63(3): p. 285, 1992 (1 ref, Eng).

Cholesterol, stigmasterol, beta-sitosterol, lauric acid, myristic acid, palmitic acid, stearic acid, oleic acid and linoleic acid have been isolated from the leaves of *C.amblyocarpa* and identified.

9205-3165 Engel, R., Nahrstedt, A., Hammerschmidt, F.J. (Institut für Pharmazeutische Biologie und Phytochemie der Westfälischen Wilhelms-Universität, D-4400 Münster, Federal Republic of Germany) **The essential oil of *Cedronella canariensis* and *C.canariensis* var. *anisata*.** *Planta Medica*, v. 57(Supplement 2): p. A80-A81, 1991 (2 ref, Eng).

Essential oils were obtained after the hydrodistillation of fresh leaves of both the species *C.canariensis* and *C.canariensis* var. *anisata*. Different components of essential oils were identified by comparison of their retention indices and by their mass spectra. The major component of *C.canariensis* was pinocarvone (55.2 percent) and that of *C.canariensis* var. *anisata* was methylchavicol (83.3 percent), which is responsible for anis-like smell of variety.

9205-3166 Engstrom, K., Lundgren, L.L., Samuelsson, G.* (Department of Pharmacognosy, Uppsala University, Biomedical Center, Box 579, S-751 23 Uppsala, Sweden) **Bioassay-guided isolation of serotonin from fruits of *Solanum tuberosum* L..** *Acta Pharmaceutica Nordica*, v. 4(2): p. 91-92, 1992 (3 ref, Eng).

An ethanol extract of the fruits of *S.tuberosum* cv. *Saturna* was partitioned between water and petroleum ether. The aqueous fraction had contractive effect on the isolated guinea-pig ileum. Chromatography of this fraction on Sephadex LH-20 and silica gel was monitored by the guinea-pig ileum test and resulted in isolation of serotonin. HPLC analysis of the content of serotonin in fruits, leaves and tubers of the plant, showed that the fruits and leaves contained 7.5 microg and 2 microg, respectively, of serotonin/g fresh weight. In agreement with previous observations, no serotonin was detected in the tubers.

9205-3167 Feliciano, A.S., Miguel del Corral, J.M., Lopez, J.L., De Pascual-Teresa, B. (Department of organic and Pharmaceutical Chemistry, Faculty of Pharmacy, 37007 Salamanca, Spain) **Labdane acids from polar extracts of *Juniperus thurifera*.** *Phytochemistry*, v. 31(5): p. 1719-1722, 1992 (14 ref, Eng).

Seven new labdane acids: 3alpha,15-dihydroxy-labd-8(17)-en-19-oic; (14R) and (14S) 14,15-dihydroxy-8,13-epoxy-labdan-19-oic; 3alpha-hydroxy-13-oxo-14,15-dinorlabd-8(17)-en-19-oic; 3alpha,15-dihydroxy-14-oxo-labd-8(17),13(16)-dien-19-oic; (14R) and (14S) 3alpha,14,15-trihydroxy-labd-8(17),13(16)-dien-19-oic acids, have been isolated as acetates and methyl esters from a chloroform extract of the leaves of *J.thurifera*.

9205-3168 Feliciano, A.S., Miguel del Corral, J.M., Lopez, J.L., De Pascual-Teresa, B. (Department of Organic and Pharmaceutical Chemistry, Faculty of Pharmacy, 37007 Salamanca, Spain) **8-Hydroxy-labdanes from *Juniperus thurifera*.** *Phytochemistry*, v. 31(5): p. 1713-1717, 1992 (13 ref, Eng).

Seven new diterpene acids: 8-hydroxy-14-oxo-15-norlabd-13(14)-en-19-oic; sclareolic; episclareolic; 8,15-dihydroxy-14-oxo-labd-13(16)-en-19-oic; 8,15-

dihydroxy-labd-13E-en-19-oic, and (14R)- and (14S)-8,14,15-trihydroxy-labd-13(16)-en-19-oic acids as well as three known labdane diterpenoids and a sesquiterpenoid were isolated from a chloroform extract of the leaves of *J.thurifera*. Their structures were elucidated by spectral analysis and chemical correlations.

9205-3169 Fingerhut, T., Bugge, G., Lichius, J.J., Wichtl, M. (Institut für Pharmazeutische Biologie der Philipps-Universität Marburg, Deutschhausstr. 17 1/2, D-3550 Marburg/Lahn, Federal Republic of Germany) **Cardiac glycosides in the leaves of some F1-hybrids of species of *Digitalis*, especially of *Digitalis ferruginea*.** *Planta Medica*, v. 57(Supplement 2): p. A70-A71, 1991 (7 ref, Eng).

A report is given on the results obtained by HPLC analyses of single F1-hybrid plants of different species of *Digitalis*, in which *D.ferruginea* is involved as one crossing-partner- both as the male parent and as the female parent. In 4 hybrids the total glycoside content is at a considerably higher level than in the parent plants. The total glycoside content is mainly influenced by the female parent. Differing from the hybrids of *D.lanata*, a higher concentration of digoxigenin glycosides, especially of lanatoside C is found in the crosses between *D.ferruginea* and species not containing lanatoside C.

9205-3170 Fleisher, Z., Fleisher, A. (Crompton & Knowles Corporation, 1595 MacArthur Boulevard, Mahwah, NJ 07430, USA) **The odoriferous principles of mandrake, *Mandragora officinarum* L. aromatic plants of the holy land and the sinai. part IX.** *Journal of Essential Oil Research*, v. 4(2): p. 187-188, 1992 (Eng).

The odoriferous constituents of the fruits of mandrake (*Mandragora officinarum*) a legendary and romantic Biblical plant, were studied for the first time. Ethylbutyrate (~22 percent), hexanol (~14 percent), butylacetate (~9 percent) and hexylacetate (~7 percent) were found to be major among fifty-five components, identified by capillary GC/MS. In addition, an unusually high proportion of sulphur containing compounds (over 7 percent), which contributes to the heavy, fruity and provocative odor of the mandrake fruit was also characterized.

9205-3171 Fukamiya, N., Okano, M., Miyamoto, M., Tagahara, K., Lee, K.H. (Interdisciplinary Studies of Natural Environment, Faculty of Integrated Arts and Sciences, Hiroshima University, Hiroshima 730, Japan) **Antitumor agents, 127. Bruceoside C, a new cytotoxic quassinoid glucoside, and related compounds from *Brucea javanica*.** *Journal of Natural Products*, v. 55(4): p. 468-475, 1992 (15 ref, Eng).

Bruceoside C (C₃₂H₄₃O₁₆; mp 174-78 degree), a new quassinoid glucoside, and related compounds were isolated from *Brucea javanica* fruits, and their structures were elucidated by spectral data. Bruceoside C showed potent cytotoxicities against KB, A-549, RPMI, and TE-671 tumor cells.

9205-3172 Fukuyama, Y., Hasegawa, T., Toda, M., Kodama, M., Okazaki, H. (Faculty of Pharmaceutical Sciences, Tokushima Bunri University, Yamashiro-cho, Tokushima 770, Japan) **Structure of americanol A and isoamericanol A having a neurotrophic property from the seeds of *Phytolacca americana*.** *Chemical & Pharmaceutical Bulletin*, v. 40(1): p. 252-254, 1992 (14 ref, Eng).

The structures of new neo-lignans, isoamericanol A and americanol isolated from the seeds of *P.americana* have been elucidated on the basis of spectroscopic data and then confirmed by chemical correlation with the previously known isoamericanin A and americanin A. Isoamericanol A, americanol A, and americanin A have been found to enhance choline acetyltransferase activity at 10⁻⁵ M in a cultured neuronal cell system derived from fetal rat hemisphere.

9205-3173 Fuller, E., Blaschek, W., Franz, G. (Department of Pharmacy, University of Regensburg, D-8400 Regensburg, Federal Republic of Germany) **Characterization of water-soluble polysaccharides from Chamomile flowers.** *Planta Medica*, v. 57(supplement 2): p. A40, 1991 (9 ref, Eng).

The structural features of the water-soluble polysaccharides of chamomile *Chamomilla recutita* flowers were investigated. Dried flower heads were powdered (mm), preextracted with methanol and petroleum ether, followed by water extraction. In aqueous extracts of chamomile flowers at three characteristic types of polysaccharides were found: (i) a fructan of the inulin type; (ii) rhamnogalacturonan type pectins with differences in molecular mass, degree of ramification, uronic acid content and in DS with methanol., and (iii) a 4-O-methylglucuronoxylan of high relative molecular mass.

9205-3174 Gasic, O., Kanjo, I., Loukis, A., Bacic, T. (Institute of Chemistry, Faculty of Sciences, University of Novi Sad, 21000 Novi Sad, Yugoslavia) **Alkaloids from Yugoslavian *Corydalis solida*.** *Planta Medica*, v. 57(Supplement 2): p. A38, 1991 (5 ref, Eng).

The *C.solida* was collected from two different floristic regions: Fruska Gara in Vojvodina (a), and Mosor mountain at the Adriatic coast (b). eleven benzyloquinoline alkaloids (BA) were isolated from the plant

material of locality and the major alkaloids was aporphine alkaloid predicine. From the plants of locality b, 5 BA were isolated and the major alkaloid was berberine alkaloid tetrahydropalmatine.

9205-3175 Gasic, O., Ribar, B., Djurkovic, R., Popovic, M., Meszaros, C., Dutschewska, H., Engel, P. (Institute of Chemistry, Faculty of Sciences, University of Novi Sad, 21000 Novi Sad, Yugoslavia) **Thalactamine: The main alkaloid of *Thalictrum minus***. *Planta Medica*, v. 57 (Supplement 2): p. A101-A102, 1991 (4 ref, Eng).

The isolation, identification, and molecular geometry determination of thalactamine, the major alkaloid of *T. minus* has been reported.

9205-3176 Gaydou, E.M., Viano, J., Bourreil, P.J.L. (Laboratoire de Phytochimie, Faculte des Sciences et Techniques de Saint Jerome, Marseille Cedex 13, France) **Canavalia ensiformis neutral lipids, a rich source of lupeol**. *Journal of American Oil Chemists' Society*, v. 69(5): p. 495-497, 1992 (24 ref, Eng).

Ripe, unprocessed *C. ensiformis* beans used as feed have a toxic effect on animals. The composition of the neutral lipids (2.21 percent) of the whole seed has been investigated. Fatty acid composition is characterized by the presence of palmitic, oleic, linoleic and linolenic acids. The unsaponifiable matter (7.9 percent) of the neutral lipids was investigated for sterol, 4 α -methyl sterol and triterpene alcohols. The occurrence of lupeol (96 percent) in this fraction constitutes an interesting source for this compound.

9205-3177 Ghedira, K., Chemli, R., Richard, B., Zeches, M., Le Men-Olivier, L. (Laboratoire de Pharmacognosie, Faculte de Pharmacie rue Avicenne, 5000 Monastir, Tunisie) **Contributions to the study of traditional pharmacopoea of Tunisia: Study of aerial parts of *Ajuga reptans* (L.) Schreb.** *Plantes Medicinales et Phytotherapie*, v. 25(2-3): p. 100-111, 1991 (26 ref, Eng, Fre).

Four vouchers of fresh and dried aerial parts of *Ajuga reptans* have been studied. Seven known compounds have been isolated: cyasterone, makisterone A, ecdysterone, harpagide, 8-O-acetyl harpagide and two flavonoids: naringin and apigenin-7-O-neohesperidoside. The two latter compounds, isolated from the fresh drug, are isolated for the first time in *Ajuga* genus.

9205-3178 Ghosh, B.B., Ray, S., Bhattacharyya, P., Datta, P.K., Mukherjee, B.B., Patra, A., Banerjee, A.K., Barua, A.K. (Department of Chemistry, Bose Institute, Calcutta 700 009, WB, India) **Cymbinodin-B, a phenanthroquinone from *Cymbidium aloifolium***. *Indian Journal of Chemistry*, v. 31B(8): p. 557-558, 1992 (10 ref, Eng).

Cymbinodin-B has been isolated from the orchid *Cymbidium aloifolium* and its structure has been established as 3,6,7,8 tetramethoxy-1,4-phenanthraquinone on the basis of spectral data.

9205-3179 Gilsoul, J.J., Jeanfils, J.* (Universite Louis Pasteur, Strasbourg, Faculte de Pharmacie, 74 Route du Rhin, BP 24, F-67401 Illkirch Cedex, France) **Antioxidative activity of *Picea abies* and *Melissa officinalis* extracts on peanut oil**. *Bulletin de la Societe Botanique de France, Lettres Botaniques*, v. 139(1): p. 35-43, 1992 (19 ref, Eng).

Differential scanning calorimetry in an isothermal mode was used to study antioxidant activity of different plant extracts on peanut oil. Essential oil of *P. abies* had no antioxidant activity while an alcoholic extract of the same species had an antioxidant activity. Alcoholic extract of *M. officinalis* showed antioxidant activity. The same extract free of phenols had a greater effect.

9205-3180 Glowinski, K., Doraczynska-Szopa, A., Erkelens, C., van der Sluis, W.G. (Department of Pharmacognosy and Technical Laboratory, Medical Academy, Pstrowskiego 12, 20-007 Lublin, Poland) **Isopeucenidin and libanotin from *Libanotis intermedia* roots: isolation and NMR-analysis**. *Planta Medica*, v. 57 (supplement 2): p. A52, 1991 (3 ref, Eng).

The dihydro-furanocoumarins isopeucenidin (main coumarin) and libanotin were isolated from the roots of *L. intermedia* ssp. *intermedia*. The compounds were identified mainly by means of NMR data. The ¹³C NMR data of isopeucenidin were assigned by means of two-dimensional short-range and long-range ¹H/¹³C-coupled (HETCOR) data.

9205-3181 Gonda, R., Takeda, K., Shimizu, N., Tomoda, M. (Kyoritsu College of Pharmacy, Shibakoen, Minato-ku, Tokyo 105, Japan) **Characterization of a neutral polysaccharide having activity on the reticuloendothelial system from the rhizome of *Curcuma longa***. *Chemical & Pharmaceutical Bulletin*, v. 40(1): p. 185-188, 1992 (23 ref, Eng).

A neutral polysaccharide, named ukonan D, was isolated from the rhizome of *C. longa*. It produced a single band on electrophoresis and a single peak on gel chromatography. It showed remarkable reticuloendothelial system-potentiating activity in a carbon clearance test. Ukonan D is composed of L-arabinose: D-galactose: D-glucose: D-mannose in the molar ratio of 1:1:12:0.2, in addition to small amounts of peptide moiety. Methylation analysis, carbon-13 nuclear magnetic resonance and enzymic degradation studies indicated that its structural features includes mainly both α -1,5-linked L-arabino- β -3,6-branched D-

galactan type and alpha-4,6-branched D-glucan type structural units. The influence of degradation with alpha-amylase followed by the elimination of glucan side chains on its immunological activity has been discussed.

9205-3182 Gonzalez, A.G., Aguiar, Z.E., Grillo, T.A., Luis, J.G. (Centro de Productos Naturales Organicos Antonio Gonzalez, Universidad de La Laguna, Carretera La Esperanza 2, La Laguna, 38206 Tenerife, Canary Islands, Spain) **Diterpenes and diterpene quinones from the roots of *Salvia apiana*.** *Phytochemistry*, v. 31(5): p. 1691-1695, 1992 (15 ref, Eng).

The new natural diterpenes, 6,7-didehydroferruginol, 6,7-didehydrosemperviol, 16-hydroxy-6,7-didehydroferruginol, 11,12,16-trihydroxy-20(10 to 5)abeoabieta-1(10),6,8,11,13-pentaene, the diterpene quinones, 16-hydroxyroyleanone and 6-deoxo-5,6-didehydrolanugon Q plus the known compounds ferruginol, miltiodiol, cryptotanshinone, lanugon Q and salvicanol were isolated from the roots of *Salvia apiana*. Their structures were established by spectrometry.

9205-3183 Gonzalez, A.G., Jimenez, I.A., Ravelo, A.G.* (Instituto Universitario de Bio-Organica CPNO Antonio Gonzalez, Universidad de la Laguna 38206 Tenerife, Canary Islands, Spain) **Triterpenes from *Maytenus canariensis* and synthesis of a derivative from betulin.** *Phytochemistry*, v. 31(6): p. 2069-2072, 1992 (20 ref, Eng).

The new triterpenes 3beta,28,30-lup-20(29)ene-triol and 28,30-dihydroxy-lup-20(29)-en-3-one have been isolated from *M. canariensis* and their structures determined by means of spectral studies and chemical correlations. A derivative of the first triterpene has been partially synthesized from betulin 3beta,28-lup-20(29)ene-diol.

9205-3184 Gonzalez, A.G., Barrera, J.B., Mendez, J.T., Sanchez, M.L., Martinez, J.L.E. (Centro de Productos Naturales Organicos Antonio Gonzalez, I.P.N.A./C.S.I.C., Carretera La Esperanza 2, La Laguna, 38206 Tenerife, Canary Islands, Spain) **Sesquiterpene lactones and other constituents of *Tanacetum* species.** *Phytochemistry*, v. 31(5): p. 1821-1822, 1992 (8 ref, Eng).

One known and three new eudesmanolide derivatives were isolated in the form of their acetates from *Tanacetum ferulaceum*. *Tanacetum ptarmicaeflorum* gave three known germacranolides as well as other known compounds. The new substances were characterized by spectroscopic and chemical methods.

9205-3185 Govindachari, T.R., Sandhya, G., Ganeshraj, S.P. (Center for Agrochemicals Research, Spic Science Foundation, 110, Mount Road Guindy, Madras 600032, TN,

India) **Structure of azadirachtin K, a new tetranortriterpenoid from *Azadirachta indica*.** *Indian Journal of Chemistry*, v. 31B(6): p. 295-298, 1992 (9 ref, Eng).

Azadirachtin K, a new tetranortriterpenoid has been isolated from the seed kernels of *A. indica* and its structure established by spectral measurements. Other tetranortriterpenoids nimbolide, olichinolide B, 6-deacetylnimbin, azadiradione, nimbin and salanin have also been isolated in the course of this work utilising preparative HPLC.

9205-3186 Grande, M., Torres, P., Piera, F., Bellido, I.S. (Departamento de Quimica Organica, Facultad de C. Quimicas, E-37008 Salamanca, Spain) **Triterpenoids from *Dittrichia viscosa*.** *Phytochemistry*, v. 31(5): p. 1826-1828, 1992 (20 ref, Eng).

A phytochemical study of the aerial parts of *Dittrichia viscosa* syn. *Inula viscosa* resulted in the isolation of 10 triterpenoids as free alcohols, acetates or fatty esters. One of the esters, 3beta-acetoxydammara-20,25-diene-24-ol, has been isolated for the first time as a natural compound.

9205-3187 Guggisberg, A., Hesse, M. (Organisch-Chemisches Institut der Universitat Zurich, Winterthurerstrasse 190, CH-8057 Zurich, Switzerland) (**Milestones in the alkaloid research published in *Helvetica Chimica Acta*, 1918-1991.** *Helvetica Chimica Acta*, v. 75(3): p. 647-688, 1992 (141 ref, Ger).

Only title translated.

9205-3188 Guha, P.K., Bhattacharyya, A. (Department of Agricultural Chemistry and Soil Science, Bidhan Chandra Krishi Viswavidyalaya, Kalyani 741 235, West Bengal, India) **5,8-Dihydroxy-7-methoxyflavone from the immature leaves of *Didymocarpus pedicellata*.** *Phytochemistry*, v. 31(5): p. 1833-1834, 1992 (11 ref, Eng).

A new flavone, pediflavone, has been isolated from the immature leaves of *Didymocarpus pedicellata* and identified as 5,8-dihydroxy-7-methoxyflavone.

9205-3189 Hahn, R., Nahrstedt, A. (Institut für Pharmazeutische Biologie und Phytochemie der Westr. Wilhelms-Universität, D-4400 Münster, FRG) **Cinnamic acids and new caffeoyl glyconic acid esters obtained from the herb of *Chelidonium majus*.** *Planta Medica*, v. 57(Supplement 2): p. A119, 1991 (9 ref, Eng).

Total hydrolysis of the aqueous/methanolic extract obtained from the air-dried or lyophilized aerial material was separated using column chromatography on Sephadex LH 20 and subsequent MLCCC; final purification by HPLC on RP-18 yielded four substances identified as 2-(-)-caffeoyl-D-glyceric acid, 4-(-)-caffeoyl-L-threonic acid, and

2-(-)-caffeoyl-L-threonic acid lactone; one ester was identified as (+)-caffeoyl-L-malic acid..

9205-3190 Hamburger, M., Wang, Y., Cheng, C.H.K., Costall, B., Naylor, R.J., Jenner, P., Hostettmann, K. (Institut de Pharmacognosie et Phytochimie, Ecole de Pharmacie, Universite de Lausanne, BEP, CH-1015 Lausanne, Switzerland) **Neurotoxic sesquiterpene lactones from the yellow star thistle *Centaurea solstitialis*: Large-scale isolation and biological activity.** *Planta Medica*, v. 57(Supplement 2): p. A8-A9, 1991 (4 ref, Eng).

In a activity-directed investigation, a CHCl_3 extract of the aerial parts of *C.solstitialis* was strongly toxic to cultured rat foetal brain cells. Subsequently, the sesquiterpene lactones 1-4 were isolated, two of them, namely solstitialin 13-acetate and cynaropicrin, being toxic in the bioassay. The neurotoxins were isolated to obtain large quantities of 3 and 4 for in vivo testing, to isolate additional toxins from the minor active fractions and to isolate structurally related non-toxic sesquiterpenes for structure-activity studies. Results from the in vitro toxicity assays are presented along with lipophilicity measurements carried out on the isolates. Lipophilicity is a major factor affecting drug penetration and accumulation in the brain.

9205-3191 Hammouda, F.M., Seif El-Nesr, M.M., Ismail, S.I., Shahat, A.A. (Pharmaceutical Sciences Department, National Research Centre, Dekki, 12311 Cairo, Egypt) **HPLC Evaluation of the active constituents in the newly introduced Romanina strain of *Cynara scolymus* cultivated in Egypt.** *Planta Medica*, v. 57(Supplement 2): p. A119-A120, 1991 (5 ref, Eng).

Quantitative determination of the caffeoylquinic derivatives and flavonoids in mature leaves of *C.scolymus* (Romanian strain), newly introduced and cultivated in Egypt for the first time is reported. The effects of plant age, number of harvests, successive plantation for three seasons, as well as a comparison between the Romanian and Egyptian strains were investigated. As the leaves grew, the flavonoidal content (luteolin-7-O-glucoside, luteolin-7-O-rutinoside, and luteolin) fluctuated markedly, while the relative percentage of the other compounds (polyphenols) decreased. Wide variations in the detected compounds in the leaves of Egyptian and Romanian strains have been attributed to the different rates of biosynthesis and/or transformation of these components.

9205-3192 Harmala, P., Kaltia, S., Vuorela, H., Hiltunen, R. (Pharmacognosy Division, Department of Pharmacy, University of Helsinki, SF-00170 Helsinki, Finland) **A furanocoumarin from *Angelica archangelica*.** *Planta Medica*, v. 58(3): p. 287-289, 1992 (19 ref, Eng).

A new dihydrofuranocoumarin, 2'-angeloyl-3'-isovaleryl vaginatge, was isolated from the roots of *A.archangelica* subsp. *archangelica*. Archangelicin was also present. The isolation was carried out from a chloroform extract using medium-pressure liquid chromatography(MPLC). The structure was determined by a combination of conventional spectroscopic methods (UV, IR, $^1\text{H-NMR}$, $^{13}\text{C-NMR}$ and EI-MS). 2D-NMR was also used in elucidating the structure.

9205-3193 Heuer, S., Wray, V., Metzger, J.W., Strack, D. (Institut für Pharmazeutische Biologie der Technischen Universität Braunschweig, Mendelssohnstrasse 1, D-3300 Braunschweig, FRG) **Betacyanins from flowers of *Gomphrena globosa*.** *Phytochemistry*, v. 31(5): p. 1801-1807, 1992 (15 ref, Eng).

The betacyanins gomphrenin I (betanidin 6-O-beta-glucoside) and its acylated forms gomphrenin II (betanidin 6-O-{6'-O-(E-4-coumaroyl)-beta-glucoside}) and gomphrenin III (betanidin 6-O-{6'-O-E-feruloyl-beta-glucoside}) were isolated from flowers of *G.globosa* and their structures elucidated by NMR spectroscopy and ion spray mass spectrometry by comparison with betanin (betanidin 5-O-beta-glucoside) and its feruloyl conjugate lampranthin II (betanidin 5-O-{6'-O-E-feruloyl-beta-glucoside}), which were isolated from *Beta vulgaris* roots and *B.vulgaris* cell suspension cultures, respectively.

9205-3194 Higuchi, H., Fukui, K., Kinjo, J., Nohara, T.* (Faculty of Pharmaceutical Sciences, Kumamoto University, 5-1 Oe-honmachi, Kumamoto 862, Japan) **Four new glycosides from *Albizia* Cortex. III.** *Chemical & Pharmaceutical Bulletin*, v. 40(2): p. 534-535, 1992 (10 ref, Eng).

Four new glycosides, together with icariside E5, were isolated from *Albizia* Cortex, the dried stem bark of *Albizia julibrissin*. These were determined to be 3,4,5-trimethoxyphenol 1-O-beta-D-apiofuranosyl-(1 to 2)-beta-D-glucopyranoside; vomifoliol 3'-O-beta-D-apiofuranosyl-(1 to 6)-beta-D-glucopyranoside; (+)-lyoniresinol 9'-O-beta-D-glucopyranosyl-(1 to 4)-beta-D-glucopyranoside; (+)-lyoniresinol 4,9'-di-O-beta-D-glucopyranoside by spectroscopic and chemical methods..

9205-3195 Horvat, R.J., Senter, S.D., Chapman, G.W., Payne, J.A. (USDA-ARS, Richard B. Russell Agricultural Research Center, PO Box 5677, Athens, GA 30613, USA) **Volatile compounds from the mesocarp of persimmons.** *Journal of Food Science*, v. 56(1): p. 262-263, 1991 (7 ref, Eng).

Steam volatile fractions from astringent and non-astringent persimmons (*Diospyros kaki*) and the native American persimmon (*D. virginiana*) were analysed by GC and GC/MS. Bornylacetate and (E)-2-hexenal were major components from all cultivars. Minor constituents include (E)-2-hexenol, phenylacetaldehyde, phenylethyl acetate, borneol, benzothiazole, nerylacetate palmitic acid, and two saturated normal hydrocarbons (C₂₃H₄₈ & C₂₅H₅₂). From threshold values and concentrations, (E)-2-hexenal and bornyl acetate probably are major contributors of persimmon aroma.

9205-3196 Hosny, M., Calts, I., Nishibe, S. (Hacettepe University, Faculty of Pharmacy Department of Pharmacognosy, TR-06100 Ankara, Turkey) **Secoiridoids from *Fraxinus angustifolia*. *Planta Medica*, v. 57(Supplement 2): p. A81, 1991 (4 ref, Eng).**

Extraction of the dried leaves of *F. angustifolia* with methanol, followed by partition between n-butanol-water and fractionation over polyamide yielded several fractions. Further purification of the secoiridoid-containing fractions using different chromatographic methods. The chemical structures of the isolated compounds were established by chemical and spectral (UV, IR, FAB-mass, ¹H- and ¹³C-NMR) evidence. Among them, 1 was a new nonglycosidic compound and has been named as ligstral. Compounds 4 and 5 were found to be new secoiridoid diglucosides and were named as angustifoliosides A and B, respectively. Compounds 2 and 3 were the known secoiridoid glucosides, ligstroside and oleuropein.

9205-3197 Hu, Y.J., Shen, X., Mu, Q.Z., Lu, Y., Zheng, Q.T. (Laboratory of Phytochemistry, Southwest Forestry College, Kunming 650224, China) **Steroidal constituents from *Amalocalyx yunnanensis*. *Phytochemistry*, v. 31(6): p. 2099-2102, 1992 (4 ref, Eng).**

Three steroidal constituents having the rare cis-B/C ring junctions (8 α -OH, 9 α -H), named amalogenin A, amaloside A and amaloside B, were isolated from the vine of *A. yunnanensis*. The structures were deduced by precise NMR studies and confirmed by X-ray diffraction for amaloside A. The structures were shown to be 3 β , 8 α -dihydroxy-8 α , 9 α , 14 β , 17 β , 20(R)-pregn-5-ene-14, 20-epoxy-13-carboxylic-20-lactone (amalogenin A), amalogenin A 3-O- β -D-diginopyranoside (amaloside A) and amalogenin A 3-O- β -D-glucopyranosyl(1-4)- β -D-diginopyranoside (amaloside B).

9205-3198 Huq, F.*, Saha, G.C., Feroza Begum, Adhikary, S. (BCSIR Laboratories, Dhaka, Bangladesh) **Studies on *Allium sativum* Linn. Garlic. Part II. Chemical investigations on garlic oil. *Bangladesh Journal of Scientific***

and Industrial Research, v. 26(1-4): p. 41-51, 1991 (27 ref, Eng).

The fatty acids composition of garlic *A. sativum* oil was established by GLF and the major fatty acids were linoleic and linolenic, palmitic and stearic acids. The phospholipids present in the oil were lysolecithin, lecithin, phosphatidyl inositol, phosphatidyl serine and phosphatidyl ethanolamine. The unsaponifiable matters were analysed for their sterol content by Argentation TLC and beta-sitosterol was found predominant.

9205-3199 Hyodo, S., Etoh, H., Yamashita, N., Sakata, K., Ina, K. (Department of Applied Biological Chemistry, Shizuoka University, 836 Ohya, Shizuoka 422, Japan) **Structure of resinosides from *Eucalyptus resinifera* as repellents against the blue mussel *Mytilus edulis*. *Bioscience, Biotechnology and Biochemistry*, v. 56(1): p. 138, 1992 (10 ref, Eng).**

Ethyl-acetate soluble portion of methanol extract of leaves of *E. resinifera* on chromatography afforded resinosides A and B with repellent activity against blue mussel. Resinosides A and B are unique in having the structure of a monoterpene carboxylic acid and substituted flavonol glucoside.

9205-3200 Ionkova, I., Ninov, S., Kolev, D., Alfermann, A.W. (Institute of Pharmacology and Pharmacy, Medicinal Academy, 2 Dunaw Street, BG-1000 Sofia, Bulgaria) **Secondary constituents of in vitro cell and transformed root cultures of *Althaea officinalis* var. *Russalka*. *Planta Medica*, v. 57(Supplement 2): p. A41-A42, 1991 (Eng).**

From the methanolic extracts of callus the flavonoid aglycones quercetin, kaempferol and haringenin were identified by TLC/HPLC. Besides the phenolic acids, caffeic, chlorogenic and p-cumaric acids, the coumarin scopoletin was found. This is the first report of secondary constituents of in vitro cultures from *A. officinalis* var. *Russalka*.

9205-3201 Irizar, A.C., Fernandez, M.F., Gonzalez, A.G., Ravelo, A.G. (Departamento de Farmacia y Tecnologia Farmaceutica, Facultad de Farmacia, Universidad de Navarra, Pamplona, Spain) **Constituents of *Prunus spinosa*. *Journal of Natural Products*, v. 55(4): p. 450-454, 1992 (15 ref, Eng).**

Five known flavanoids, kaempferol 3,7-dirhamnoside, kaempferol, quercetin, catechin, and epicatechin have been obtained from *P. spinosa* together with the new compound, 5-hydroxy-6-methoxy-7-O- β -D-glucosyl coumarin, and a recently isolated type A proanthocyanidin dimer, ent-epicatechin-(2 α -7, 4 α -8)-catechin. The absolute configuration of the latter was determined by means of CD studies and application of the Horeau method.

9205-3202 Ishida, H., Nukaya, H., Tsuji, K., Zenda, H., Kosuge, T. (School of Pharmaceutical Science, University of Shizuoka, Yada 395, Shizuoka 422, Japan) **Studies on active principles of tars. X. The structures and some reactions of antifungal constituents in Pix Pini.** *Chemical & Pharmaceutical Bulletin*, v. 40(2): p. 308-313, 1992 (16 ref, Eng).

By following the antifungal activity, four antifungal principles, acetovanillone (1, two new cyclic beta-diketones, (2 and 3), and an unknown compound (4) were isolated from wood tar, Pix Pini, which has been used traditionally for the treatment of fungal diseases in Japan. The structures of 2 and 3 were established by synthesis to be 1,1',3,3'-tetraoxo-2,2'-bicyclopentenyl and its 4-methyl derivative, respectively. Chemical reactivities and physical properties of 2 and 3 are also described.

9205-3203 Ito, C., Okahana, N., Wu, T.S., Wang, M.L., Lai, J.S., Kuoh, C.S., Furukawa, H. (Faculty of Pharmacy, Meijo University, Tempaku, Nagoya 468, Japan) **New carbazole alkaloids from *Murraya euchrestifolia*.** *Chemical & Pharmaceutical Bulletin*, v. 40(1): p. 230-232, 1992 (13 ref, Eng).

Two new monomeric and one dimeric carbazole alkaloids were isolated from root bark of *M. euchrestifolia* collected in Taiwan. Their structures were elucidated by spectrometric and synthetic studies. The structures of the monomeric carbazoles were assigned as 3-formyl-7-hydroxy-9 H-carbazole and N-methoxy-3-hydroxymethyl-9 H-carbazole. The dimeric carbazole, named chrestifoline-D, was found to be identical with the oxidation product of bismurrayafoline-A.

9205-3204 Janeczko, Z., Jagiello, K., Jansson, P.E., Piskornik, M. (Department of Pharmacognosy, Academy of Medicine, Skaleczna 10 Str., 31-065 Krakow, Poland) **Triterpene saponins from *Anemone coronaria*.** *Fitoterapia*, v. 63(2): p. 191, 1992 (5 ref, Eng).

Koronaroside A: hederagenin-3-O-alpha-L-rhamnopyranosyl (1-2)-alpha-L-arabinopyranoside, Koronaroside B: 3-O-alpha-L-rhamnopyranosyl (1-2)-alpha-L-arabinopyranosyl-hederagenin-28-O-alpha-L-rhamnopyranosyl (1-4)-beta-D-glucopyranosyl (1-6)-beta-D-glucopyranoside and koronaroside C: 3-O-alpha-L-rhamnopyranosyl (1-2)-beta-D-glucopyranosyl (1-4)-beta-D-glucopyranosyl (1-6)-beta-D-glucopyranoside, were isolated from *A. coronaria* rhizomes.

9205-3205 Jantan, I.B., Goh, S.H. (Forest Research Institute of Malaysia, P O Box 201, Kepong, 52109, Kuala Lumpur, Malaysia) **Essential oils of *Cinnamomum* species from**

Peninsular Malaysia. *Journal of Essential Oil Research*, v. 4(2): p. 161-171, 1992 (12 ref, Eng).

The chemical composition of the leaf, bark and wood oils of *Cinnamomum* species (*C. pubescens*, *C. javanicum*, *C. iners*, *C. impressicostatum*, *C. millissimum*, *C. porrectum* and *C. camphora*) was examined by co-chromatography. The major components of the leaf, bark and wood oils were identified. These species could be useful new natural sources for safrole, eugenol, linalool, camphor and benzyl benzoate, which are commercially important chemicals in the flavor, fragrance and pharmaceutical industries. The distribution and accumulation of the compounds in different parts of the plant within the same species or among different species may be used for taxonomic purposes and for future use in the identification of possible varieties of *Cinnamomum* species.

9205-3206 Jenett, K., Kaloga, M., Eich, E. (Institut für Pharmazeutische Biologie, Freie Universität Berlin, D-1000 Berlin 33, Federal Republic of Germany) **Ipanguline and isoipanguline: First pyrrolizidine alkaloids from a Convolvulaceous species.** *Planta Medica*, v. 57(Supplement 2): p. A102, 1991 (2 ref, Eng).

From the seeds of the tropical annual twiner *Ipomoea angulata* (syn *I. hederifolia*, *Quamoclit angulata* collected in Sri Lanka, novel isomeric pyrrolizidine alkaloids (PAs), 1 and 2, which consist of the not widespread saturated necine base turnefordine and two necic acids were isolated and characterized. This is the first report of PAs in the large convolvulaceae family.

9205-3207 Kaltenbach, G., Schimmer, O. (Institut für Botanik und Pharmazeutische Biologie der Friedrich-Alexander-Universität Erlangen-Nürnberg, Staudstrasse 5, D-8520 Erlangen, Federal Republic of Germany) **Volatile constituents of the herbs of *Grindelia robusta* and *Grindelia squarrosa*.** *Planta Medica*, v. 57(Supplement 2): p. A82, 1991 (3 ref, Eng).

The oils of both the species were studied by GC analysis. The following 12 constituents were identified: alpha-pinene, camphene, beta-pinene, myrcene, p-cymol, limonene, terpinolene, campher, borneol, bornyl acetate, methyleugenol and beta-caryophyllene. The identification was based on gas chromatographic retention indices obtained on two phases and co-chromatography with reference substances. The oils differed in their quantitative pattern: the oil of *G. robusta* yielded much more bornyl acetate and more myrcene than the oil of *G. squarrosa*.

9205-3208 Kam, T.S., Lee, K.H., Goh, S.H. (Institute of Advanced Studies and Department of Chemistry, University of Malaya 59100, Kuala Lumpur, Malaysia) **Alkaloid**

distribution in Malaysian Uncaria. *Phytochemistry*, v. 31(6): p. 2031-2034, 1992 (11 ref, Eng).

Eight Malaysian *Uncaria* species were investigated for their alkaloidal content and the alkaloid distribution amongst the species investigated is discussed. Two new indole alkaloids, isogambirine and gambireine were isolated from *U. callophylla*. This species was also found to show a seasonal variation in its alkaloid content.

9205-3209 Kameoka, H., Kubo, K., Miyazawa, M. (Department of Applied Chemistry, Faculty of Science and Engineering, Kinki University, 3-4-1 Kowakae, Higashiosaka-city, Osaka 577, Japan) **Essential oil components of water- Convolvulus (Ipomoea aquatica Forsk.).** *Journal of Essential oil Research*, v. 4(3): p. 219-225, 1992 (7 ref, Eng).

The composition of the essential oil of *I. aquatica* has been investigated by GC, IR, ¹H-NMR and GC/MS. The oil contained 58 volatile components of which 49.14 percent were terpenoid. The main components were phytol (37.08 percent), palmitic acid (10.99 percent), (Z)-3-hexen-1-ol (5.7 percent), alpha-humulene (2.28 percent), n-hexacosane (2.25 percent) and bis(2-ethyl-hexyl) sebacate (2.17 percent).

9205-3210 Kamil, M., Jain, N., Ilyas, M. (Section of Natural Products, Department of Chemistry, Aligarh Muslim University, Aligarh 202 002, UP, India) **A novel flavone glycoside from Chenopodium ambrosioides.** *Fitoterapia*, v. 63(3): p. 230-231, 1992 (3 ref, Eng).

A new flavone glycoside, 4'-O-demethylabrectorin-7-O-alpha-L-rhamnopyranoside-3'-O-beta-D-xylopyranoside has been isolated from the fruits of *C. ambrosioides*.

9205-3211 Kang, S.S. (Natural Products Research Institute, Seoul National University, Seoul 151-747, Korea) **Studies on flavonoids from epimedium plants.** *Korean Journal of Pharmacognosy*, v. 23(1): p. 1-8, 1992 (55 ref, Eng).

Presence of forty one known and six new flavonoids in various plant parts of ten *Epimedium* species has been enlisted.

9205-3212 Karikome, H., Ogawa, K., Sashida, Y.* (Tokyo College of Pharmacy, 1432-1 Horinouchi, Hachioji, Tokyo 192-03, Japan) **New acylated glucosides of chalcone from the leaves of Bidens frondosa.** *Chemical & Pharmaceutical Bulletin*, v. 40(3): p. 689-691, 1992 (8 ref, Eng).

Five new acylated glucosides of okanin, okanin 4-O-(6"-O-acetyl-2"-O-caffeoyl-beta-D-glucopyranoside), okanin 4-O-(2"-O-caffeoyl-6"-O-p-coumaroyl-beta-D-glucopyranoside), 4-O-methylokanin 4'-O-(6"-O-

p-coumaroyl-beta-D-glucopyranoside), 4-O-methylokanin 4'-O-(6"-O-acetyl-beta-D-glucopyranoside), 4-O-methylokanin 4'-O-(6'-O-acetyl-2"-O-caffeoyl-beta-D-glucopyranoside), have been isolated from the fresh leaves of *B. frondosa*. These structures have been elucidated on the basis of spectral data and chemical correlation.

9205-3213 Karim, E.I., Ishag, K.E., Elegami, A.A.B., Mahmoud, E.N., Abu Alfutuh, I. (Department of Pharmaceutical Chemistry, Faculty of Pharmacy, University of Khartoum, Sudan) **d-Carvotanacetone from Pulicaria undulata.** *Fitoterapia*, v. 63(3): p. 281, 1992 (3 ref, Eng).

d-Carvotanacetone has been isolated from the herb and identified.

9205-3214 Kastner, U., Jurenitsch, J., Glasl, S., Lehner, S., Baumann, A., Robien, W., Kubelka, W. (Institut für Pharmakognosie, Universität Wien, Währinger Str. 25, A-1090 Wien, Austria) **New proazulenes of different taxa belonging to the Achillea millefolium group.** *Planta Medica*, v. 57(Supplement 2): p. A82, 1991 (4 ref, Eng).

TLC-screening of about 400 individuals of the most important taxa of the *A. millefolium* group for proazulenes gave positive results for *A. setacea*, *A. asplenifolia*, *A. rose-alba* and *A. collina*, whereas *A. millefolium* was free of proazulenes. In the case of positive results, the respective taxon showed a characteristic proazulene isolation was performed by a combination of different chromatographic techniques. Besides known substances of *A. setacea* and *A. collina*, some new compounds were isolated and structurally elucidated by mass and 2D-NMR spectroscopy.

9205-3215 Khaleque, A., Smail, K.M., Shafiullah, M. (Chemical Research Division, BCSIR Laboratories, Dhaka, Bangladesh) **Chemical investigations on Alstonia scholaris, Part 1: Isolation of lupeol acetate, beta-sitosterol, one alkaloid and three other.** *Bangladesh Journal of Scientific and Industrial Research*, v. 26(1-4): p. 1-7, 1991 (10 ref, Eng).

Extraction of bark of *A. scholaris* with rectified spirit led to the isolation of three new non-alkaloidal compounds, A, B, C and two known non-alkaloidal compounds lupeol acetate and beta sitosterol. An alkaloidal compound mp 252-254 degree C has been isolated by conventional acid base separation.

9205-3216 Khan, I.A., Rali, T., Sticher, O. (Department of Pharmacy, Swiss Federal Institute of Technology (ETH) Zurich, CH-8092 Zurich, Switzerland) **Isolation and structure elucidation of new triterpene constituents from Timonius timon.** *Planta Medica*, v. 57(Supplement 2): p. A72, 1991 (2 ref, Eng).

T. timon leaves were air-dried and extracted at room temperature with petroleum ether, ethyl acetate, and methanol. The fractionation of the ethyl acetate extract led to the isolation of the two new compounds 1 and 2. The structure of compound 1 was determined as 3 β ,6 β ,23-trihydroxyolean-12-en-28-oic acid and of 2 as 3 β ,6 β ,19 α ,23-tetrahydroxyolean-12-en-28-oic acid by means of UV, IR, mass, ¹H-NMR, ¹³C-NMR, DEPT and ¹H-¹³C-NMR spectroscopy.

9205-3217 Kikuzaki, H., Tsai, S.M., Nakatani, N. (Department of Food and Nutrition, Faculty of Science of living, Osaka City University, Sumiyoshi-ku, Osaka 558, Japan) **Gingerdiol related compounds from the rhizomes of *Zingiber officinale*.** *Phytochemistry*, v. 31(5): p. 1783-1786, 1992 (20 ref, Eng).

{6}-Gingerdiol and four analogues, (3R,5S)-5-acetoxy-3-hydroxy-1-(4-hydroxy-3-methoxyphenyl)decane, (3R,5S)-3-acetoxy-5-hydroxy-1-(4-hydroxy-3-methoxyphenyl)decane, (3R,5S)-3,5-diacetoxy-1-(4-hydroxy-3-methoxyphenyl)decane and (3R,5S)-3,5-diacetoxy-1-(3,4-dimethoxyphenyl)decane, were isolated from the rhizomes of *Z. officinale*. Their structures were established by chemical and spectroscopic evidence.

9205-3218 Kim, M.N., Le Scao-Bogaert, F., Paris, M. (Laboratoire de Pharmacognosie, Universite des Sciences Pharmaceutiques, rue Jean-Baptiste Clement, F-92296 Chatenay-Malabry, Cedex, France) **Flavonoids from *Carthamus tinctorius* flowers.** *Planta Medica*, v. 58(3): p. 285-286, 1992 (9 ref, Eng).

The ethanolic extract of the dried flowers of *C. tinctorius* was concentrated and extracted with solvents of increasing polarity, the diethyl ether residue was fractionated and yielded aglycones G1 and G2. On the basis of chemical and spectroscopic investigations (TLC, UV, and ¹H-NMR) compound G1 was identified as kaempferol, G2 as quercetin. The ethyl acetate residue was fractionated and yielded aglycone G3 and glycosides H1, H2, H3. The butanol extract was chromatographed and yielded glycosides H4 and H5. All these compounds have been identified by their chemical and spectral data.

9205-3219 Kitagawa, I. (Faculty of Pharmaceutical Sciences, Osaka University, 1-6, Yamada-oka, Suita, Osaka 565, Japan) **Chemical investigation of naturally occurring drug materials. Elucidation of scientific basis for traditional medicines and exploitation of new naturally occurring drugs.** *Yakugaku Zasshi*, v. 112(1): p. 1-41, 1992 (63 ref, Jap, Eng).

Bioactive constituents, in food materials and natural drugs viz., *Aconitum carmichaeli*, *Panax ginseng*, *Rehman-*

nia gluticosa, *Glycyrrhiza glabra*, *G. uralensis* and *G. inflata*, scientific basis for crude drug processing, investigation of marine natural products and chemical modification of naturally abundant carbohydrates and terpenoids have been reviewed.

9205-3220 Kitanaka, S., Takido, M. (College of Pharmacy, Nihon University, 7-7 Narashinodai, Funabashi-shi, Chiba 274, Japan) **Studies on the constituents of the leaves of *Cassia torosa* Cav. III. The structures of two new flavone glycosides.** *Chemical & Pharmaceutical Bulletin*, v. 40(1): p. 249-251, 1992 (14 ref, Eng).

Two new flavone glycosides were isolated along with diosmetin, luteolin, and luteolin 7-O-glucoside, from the leaves of *C. torosa* and their structures were established as diosmetin 3'-O-beta-D-glucopyranoside and torosaflavone B 3'-O-beta-D-glucopyranoside (diosmetin 6-C-beta-D-oliopyranosyl-3'-O-beta-D-glucopyranoside) on the basis of spectroscopic and chemical evidence.

9205-3221 Ko, S.R., Kim, S.C., Choi, K.J. (Korea Ginseng and Tobacco Research Institute, Taejeon 305 345, Korea) **Extract yields and saponin contents of red ginseng extracts prepared with various concentrations of ethanol.** *Korean Journal of Pharmacognosy*, v. 23(1): p. 24-28, 1992 (15 ref, Kor, Eng).

Panax ginseng extracts were prepared with various concentrations of ethanol, extract yields were examined and saponins in the extracts were identified and determined by TLC and HPLC, respectively. Yields of the extracts, 19.7 to 50.3 percent, were the highest in water extract and showed significant decrease with the increase of ethanol concentration used for extraction. Saponin yields from red ginseng were conspicuously increased with the increase of ethanol concentration and were 3.47 to 5.13 percent of crude saponins and 1.28 to 1.93 percent of six major ginsenosides. Saponin contents in the red ginseng extracts were 6.9 to 24.2 percent of crude saponin and 2.57 to 9.22 percent of six major ginsenosides.

9205-3222 Koike, K., Ohmoto, T. (School of Pharmaceutical Sciences, Toho University, 2-2-1 Miyama, Funabashi, Chiba 274, Japan) **New quassinoid glucosides, javanicinoside I, J, K, and L, from *Picrasma javanica*.** *Journal of Natural Products*, v. 55(4): p. 482-486, 1992 (6 ref, Eng).

Four new quassinoid glucosides, javanicinosides I (C₂₇H₄₀O₁₂; mp 165-67 degree), J (C₂₉H₄₄O₁₃; mp 202 degree), K (C₂₀H₄₂O₁₃; mp 254-55 degree), and L (C₂₇H₄₂O₁₂), have been isolated from the stem of *Picrasma javanica*. Their structures were elucidated by spectral and chemical evidence.

9205-3223 Kombal, R., Glasl, H. (Institut für Pharmazeutische Biologie und Phytochemie der Universität Münster, Hittorfstr. 56, D-4400 Münster, FRG) **Flavonoids from *Potentilla anserina*. *Planta Medica*, v. 57(Supplement 2): p. A123, 1991 (8 ref, Eng).**

Separation and identification of quercetin-3-O-beta-D-glucuronide and kaempferol-3-O-beta-D-(6"-O-p-coumaroyl)-glucopyranoside (tiliroside) from *P. anserina* aerial parts is reported. The structures were established by hydrolysis experiments and spectroscopic methods (UV, ¹H-NMR ¹³C-NMR). Both flavonoids are new compounds from *P. anserina*.

9205-3224 Konishi, T., Sugimoto, A., Kiyisawa, S.*, Fujiwara, Y. (Kyoto Pharmaceutical University, Nakaucho 5, Misasagi Yamashina-ku, Kyoto 607, Japan) **Studies on the agalwood "Jinko". XII. Structures of pentahydroxy-2-(2-phenylethyl) chromone derivatives. *Chemical & Pharmaceutical Bulletin*, v. 40(3): p. 778-779, 1992 (3 ref, Eng).**

Two new phenylethylchromone derivatives were isolated from a methanol soluble portion of pyridine extract of agalwood (Jinko). Their structures were elucidated as (5S,6R,7S,8R,7'R)-7'-hydroxyisoagarotetrol and its (7'S)-isomer, respectively.

9205-3225 Kowalewski, Z., Gawron-Gzella, A., Jablonska, A. (Katedra i Zakład Farmakologii, Akademia Medyczna im. K. Marcinkowskiego, ul. Sieroca 10, 61-771 Poznań, Polska) **Flavonoid compounds in *Raphanus sativus* L. subvar. *radicula* Pers. (Saxa) seeds. *Herba Polonica*, v. 37(1): p. 9-15, 1991 (12 ref, Eng, Pol).**

Seven flavonoid compounds have been isolated and identified from methanol extract of *R. sativus* subvar. *radicula* seeds. The compounds were determined as: kaempferol, isorhamnetin 7-glucoside, kaempferol 7-arabinoside, isorhamnetin 3-glucoside, kaempferol 3-glucoside, isorhamnetin 3,7-diglucoside and kaempferol 3-glucoside-7-arabinoside.

9205-3226 Krenn, L., Kopp, B., Wallner, E., Korhammer, S., Haslinger, E., Kubelka, W. (Institut für Pharmakognosie, Universität Wien, Wahringer Str. 25, A-1090 Wien, Austria) **Bufadienolides with branched carbohydrate chains from *Urginea epigea*. *Planta Medica*, v. 57(Supplement 2): p. A72-A73, 1991 (6 ref, Eng).**

Out of a complex of bufadienolide pattern, the four main compounds were isolated from a bulb extract (80 percent MeOH) of *U. epigea* after purification by means of CC and HPLC. The structures of the bufadienolides were established by spectroscopic methods (FAB-mass, GC-mass, NMR studies). Additionally, compounds 1 and 2 were

confirmed by comparison with the authentic samples as scillicyanosidin-3-O-beta-D-glucoside (1) and altoside (2). The aglycones of 3 and 4 were identified as scillarenin and scilliglaucosidin. Both glycosides contain the same sugar moiety.

9205-3227 Krenn, L., Bamberger, M., Kopp, B. (Institut für Pharmakognosie der Universität Wien, Wahringer Str. 25, A-1090 Wien, Austria) **A new bufadienolide from *Urginea panchratium* 1,2. *Planta Medica*, v. 58(3): p. 284-285, 1992 (7 ref, Eng, Ger).**

Only title translated.

9205-3228 Kririmer, N., Baser, K.H.C., Ozek, T., Kurkcuoglu, M. (Anadolu University Faculty of Pharmacy, Department of Pharmacognosy 26470 Eskisehir, Turkey) **Composition of the essential oil of *Calamintha nepeta* subsp. *glandulosa*. *Journal of Essential Oil Research*, v. 4(2): p. 189-190, 1992 (5 ref, Eng).**

The water distilled essential oil from the dried aerial parts of *C. nepeta* subsp. *glandulosa* was examined by GC/MS. Forty-five components representing 91.65 percent of the oil were identified. Piperitenone oxide (43.80 percent), trans-piperitone oxide (25.23 percent) and limonene (13.03 percent) were the main constituents.

9205-3229 Krishnappan, A.L., Seetharaman, T.R. (Department of Chemistry, Centre for Post-Graduate Studies, Pondicherry 605 008, India) **Flavonoids of *Merremia tridentata*. *Fitoterapia*, v. 63(2): p. 190, 1992 (3 ref, Eng).**

Diosmetin, luteolin, diosmetin-7-O-beta-D-glucoside and luteolin-7-O-beta-D-glucoside were isolated from the aerial parts of *M. tridentata*.

9205-3230 Kunapuli, S.P., Vaidyanathan, C.S.* (Department of Biochemistry, Indian Institute of Science, Bangalore 560012, Karnataka, India) **New indole oxygenase from the leaves of *Tecoma stans* L. Part I: Affinity purification and properties. *Journal of the Indian Institute of Science*, v. 71(6): p. 503-513, 1991 (20 ref, Eng).**

Indole oxygenase from the leaves of *T. stans* has been purified to homogeneity using 5-hydroxyindole-coupled epoxy-activated sepharose. The purity was checked by polyacrylamide gel electrophoresis and immunoelectrophoresis. This enzyme has been shown to be identical to the one purified by conventional purification method. Indole oxidase, an enzyme catalyzing the conversion of indole to anthranil, was not co-purified during affinity chromatography. Dissociation constants for 5-hydroxyindole, 5-bromoindole and 7-methylindole have

been determined by kinetic and fluorescence quenching experiments and compared.

9205-3231 Lahloub, M.F. (Faculty of Pharmacy, University of Mansoura, Mansoura, Egypt) **A new iridoid glucoside from *Veronica anagallis-aquatica* var. *anagalloides*.** *Planta Medica*, v. 57 (Supplement 2): p. A136-A137, 1991 (2 ref, Eng).

From the aerial parts of *V.anagallis-aquatica* var. *anagalloides*, a new iridoid glycoside, analgalloside was isolated and identified.

9205-3232 Lamaison, J.L., Petitjean-Freytet, C., Carnat, A. (Laboratoire de Pharmacognosie et Phytothérapie, Faculté de Pharmacie, Université d'Auvergne 28 Place Henri-Dunant, F 63000 Clermont-Ferrand, France) **Occurrence of isorhamnetin 3-glucoside and 3-rutinoside in *Sambucus nigra* L. flowers.** *Annales Pharmaceutiques Françaises*, v. 49(5): p. 258-262, 1991 (24 ref, Fre, Eng).

Two flavonoid glucosides were isolated from black elder *S.nigra* flowers and identified as isorhamnetin-3-O-glucoside and isorhamnetin-3-O-rutinoside.

9205-3233 Lamaty, G., Menut, C., Amvam Zollo, P.H., Kuiate, J.R., Bessiere, J.M., Ouamba, J.M., Silou, T. (Laboratoire de Chimie Organique Physique, Université de Montpellier (Montpellier II), Sciences et Techniques du Languedoc 34095 Montpellier Cedex 5, France) **Aromatic plants of tropical central Africa. IV. Essential oils of *Eupatorium odoratum* L. from Cameroon and Congo.** *Journal of Essential Oil Research*, v. 4(2): p. 101-105, 1992 (23 ref, Eng).

The chemical composition of the essential oils, which was obtained from the leaves of *E.odoratum* (collected in Cameroon, A. and Congo, B) were examined by capillary gas chromatography and combined GC/MS. The two oils were distinguished by the presence of C12 compounds rarely found in essential oils: pregeijerene and geijerene represent 34.1 percent (A) and 19 percent (B) of the essential oil obtained from the leaves. Besides these compounds, oil A contained mainly alpha-pinene (14.3 percent) and gamma-muurolene (9.8 percent); whereas, oil B was characterized by a high content of aromatic compounds (up to 40 percent) with p-cymene (22.2 percent) and thymyl acetate (15.8 percent) being the most dominant.

9205-3234 Lawrence, B.M. (RJR Tobacco Company, Bowman Gray Technical Center, PO Box 2959, Winston-Salem, North Carolina 27102, USA) **Progress in essential oils.** *Perfumer & Flavorist*, v. 17(3): p. 61-76, 1992 (35 ref, Eng).

Recent developments in the chemistry of essential oils of olibanum (*Boswellia carteri*, *B.frereara*, *B.papyrifera*, *B.serrata*), pepper (*Piper nigrum*), jasmine (*Jasminum officinale*, *J.sambac*), carrot (*Daucus carota*) seed, *Osmanthus fragrans*, *O.fragrans* var. *thunbergii*, *O.fragrans* var. *latifolius* and *O.fragrans* var. *aurantiacus* have been reviewed.

9205-3235 Le Quesne, P.W., Raffauf, R.F., Pai, N.N., Zhao, Y.Y. (Department of Chemistry, Northeastern University, Boston, Massachusetts 02115-5096, USA) **Constituents of *Cymbopetalum penduliflorum* flowers.** *Fitoterapia*, v. 63(2): p. 186, 1992 (7 ref, Eng).

Liriodenine and rhamnazin-3-O-rutinoside have been isolated from the flowers of *C.penduliflorum*.

9205-3236 Lee, M.W., Morimoto, S., Nonaka, G.I., Nishioka, I. (Faculty of Pharmaceutical Sciences, Kyushu University 62, 3-1-1 Maidashi, Higashi-ku, Fukuoka 812, Japan) **Flavan-3-ol gallates and proanthocyanidins from *Pithecellobium lobatum*.** *Phytochemistry*, v. 31(6): p. 2117-2120, 1992 (13 ref, Eng).

Chemical examination of the leaves of *P.lobatum* has led to the isolation and characterization of five flavan-3-ol derivatives including new flavan-3-ol gallates, galocatechin 3'- and 4'-O-gallates and galocatechin 7,3'- and 7,4'-di-O-gallates (almost racemic), which occur as equilibrium mixtures. Examination of the pods afforded three proanthocyanidins (procyanidins B-3 and B-4 and prodelphinidin B-1), together with flavan-3-ols.

9205-3237 Li, Q.H., Wu, Z.H., Zhang, L.L., Pan, J.D. (Anhui Institute of Medical Sciences, Hefei 230 061, China) **Structural determination of ningpeisinoside isolated from *Fritillaria ningguoensis* S.C. Chen et S.F. Yin.** *Acta Pharmaceutica Sinica*, v. 26(10): p. 794-797, 1991 (5 ref, Chi, Eng).

A new steroidal alkaloidal glucoside, C₃₄H₅₇NO₇, mp 284-286 degree C, named ningpeisinoside, was isolated from the bulb of *F.ningguoensis*. Based on preparation of derivatives and IR, MS, ¹HNMR, ¹³CNMR spectral studies, the structure of ningpeisinoside has been established as N-methyl-5alpha-veratranine-6-oxo-3beta-O-beta-D-glucoside.

9205-3238 Lichius, J.J., Wichtl, M. (Institut de Chimie des Substances Naturelles, CNRS, Avenue de la Terrasse, F-91199 Gif-sur-Yvette, France) **Quantitative analysis of cardenolide glycosides in the leaves of *Digitalis atlantica*, *Digitalis ciliata*, and *Digitalis nervosa*.** *Planta Medica*, v. 57 (Supplement 2): p. A73, 1991 (3 ref, Eng).

The results of HPLC analyses of the 3 *Digitalis* species have been reported. *D.atlantica* showed the lowest cardenolide content. Only disaccharides, ubiquitous in all *Digitalis* species could be found. *D.ciliata* like *D.atlantica*, *D.grandiflora* and *D.davisiana* contained lanatoside A as the main cardenolide besides digitalinum verum and glucogitoroside. *D.nervosa* contained lanatosides A,B, and C together with some cardenolides.

9205-3239 Loayza, I., Deslauriers, H., Jean, F.I., Collin, G.J. (Laboratoire d'Analyse et de Separation des Essences Vegetales Universite du Quebec a Chicoutimi Chicoutimi, Quebec G7H 2B1, Canada) **Volatile constituents of the essential oil of *Pluchea fastigiata* Griseb.** *Journal of Essential Oil Research*, v. 4(2): p. 191-193, 1992 (5 ref, Eng).

The essential oil of *Pluchea fastigiata*(local name: ori-ori) was analyzed by a combination of GC/MS. The oil was found to contain 39 constituents of which 22 were identified. The major compounds were beta-pinene(15-19 percent), sabinene(7-10 percent) and a variety of sesquiterpenes such as beta-caryophyllene(15-17 percent), gamma-cadinene(3-7 percent), alpha-murolene(2.0-2.3 percent). Oxygenated compounds such as caryophyllene oxide (4-7 percent) and two unidentified sesquiterpenoid compounds with a similar mass spectrum in rather high concentration (3-7 percent) were also present.

9205-3240 Ma, P.C., Lu, X.Y., Yang, J.J., Zheng, Q.T.(Institute of Dermatology, Chinese Academy of Medical Sciences, Nanjing 210 042, China) **16-Hydroxytriptolide, a new active diterpene isolated from *Tripterygium wilfordii*.** *Acta Pharmaceutica Sinica*, v. 26(10): p.759-763, 1991 (7 ref, Chi, Eng).

A new diterpene triepoxide, 16-hydroxytriptolide (C₂₀H₂₄O₇, mp 232-233 degree C) was isolated from the root and leaves of *T.wilfordii*. The structure and stereochemistry of 16-hydroxytriptolide was established on the basis of spectral data and X-ray crystallographic analysis. In the pharmacologic screening, 16-hydroxytriptolide showed antiinflammatory actions and strong immunosuppressive and antifertility activities. In antiinflammatory action, its half effective dose (ED₅₀) was 0.12 mg/kg with the model of croton oil induced ear swelling of mice. In immunosuppressive action, its ED₅₀ was 0.05mg/kg with the model of the formation of haemolysin antibody of mice.

9205-3241 Magalhaes, A.F., Helena, B., Sales, L.N., Magalhaes, E.G., Valio, I.F.M.(Instituto de Quimica and Instituto Biologia, UNICAMP, P O Box 6154, CEP 13081 Campinas, Sao Paulo, Brazil) **Flavonoids and 3-phenyl-**

coumarins from the seeds of *Pachyrhizus tuberosus*. *Phytochemistry*, v. 31(5): p. 1831-1832, 1992 (4 ref, Eng).

Analysis of the extracts from seeds (black variety) of *Pachyrhizus tuberosus* (Jacatube bean; Macuco bean, to search toxic components)furnished five flavonoids and pachyrhizin, each of which had been isolated previously from *P.erosus*, and 6-(2,4,5-trimethoxyphenyl)-7H-furo {3,2g}{1}-benzopyran-7-one, a new 3-phenylcoumarin derivative.

9205-3242 Mahmud, Z., Khan, M.N., Lajis, N.H., Toia, R.F. (Department of Chemistry, University Pertanian Malaysia, 43400 UPM Serdang, Selangor, Malaysia) **Perakensol: a phenanthrenoid isolated from *Alseodaphne perakensis*.** *Journal of Natural Products*, v. 55(4): p. 533-535, 1992 (9 ref, Eng).

Structure of a new non-alkaloidal minor constituent, perakensol, isolated from *Alseodaphne perakensis* leaves has been elucidated as 7-hydroxy-2,3,6-trimethoxyphenanthrene.

9205-3243 Maillard, M., Adewunmi, C.O., Hostettmann, K.(Institut de Pharmacognosie et Phytochimie, Universite de Lausanne, BEP, CH-1015 Lausanne, Switzerland) **A new triterpenoid compound isolated from the fruits of *Tetrapleura tetraptera*.** *Planta Medica*, v. 57(Supplement 2): p. A74-A75, 1991 (2 ref, Eng).

The isolation of saponin from the methanolic extract of the fruits of *T.tetraptera* was performed by medium-pressure liquid chromatography followed by further purification by gel filtration was obtained by enzymatic hydrolysis using beta-D-glucuronidase. The structure of triterpene was established by NMR experiments (including 2D long range COSY and selective-INEPT) as 3,27-dihydroxyolean-12-en-28-oic acid. A weak ((ppm) molluscicidal activity was exhibited by the saponin isolated.

9205-3244 Maisenbacher, P., Kovar, K.A.(Pharmazeutisches Institut der universitat Tübingen, Auf dem Morgenstelle 8, D(W)-7400 Tübingen, Federal Republic of Germany) **Adhyperforin: A homologue of hyperforin from *Hypericum perforatum*.** *Planta Medica*, v. 58(3): p. 291-293, 1992 (10 ref, Eng).

Hyperforin and its homologue adhyperforin were isolated from the flowers and fruits of *H.perforatum*: A spectroscopic data showed that the isopropylketone side chain of hyperforin is replaced by a 2-methyl propyl ketone substituent in adhyperforin.

9205-3245 Malterud, K.E.(Institute of Pharmacy, Section Pharmacognosy, The University of Oslo, P O Box 1068 Blindern, N-0316 Oslo, Norway) **C-Methylated**

dihydrochalcones from *Myrica gale* fruit exudate. *Acta Pharmaceutica Nordica*, v. 4(2): p. 65-68, 1992 (20 ref, Eng).

From the fruit exudate of *M. gale* the flavonoids 2',4'-dihydroxy-6'-methoxy-3',5'-dimethyldihydrochalcone (angoletin), 2',6'-dihydroxy-4'-methoxy-3'-methyldihydrochalcone and 2',4'-dihydroxy-6'-methoxy-3'-methyldihydrochalcone have been isolated. None of these compounds has been reported previously from this plant, and the two latter are new natural products. Their structures have been elucidated spectroscopically.

9205-3246 Matida, A.K., Nakada, M.M., Andreoni, A.S.S., Zelnik, R. (Servico de Quimica Organica, Institute butantan, C P 65, 01051, Sao Paulo, Brazil) **Triterpenoids from *Anchietea salutaris*.** *Fitoterapia*, v. 63(3): p. 271, 1992 (3 ref, Eng).

Friedelin (0.28 percent) and epifriedelanol (0.05 percent) have been isolated from leaves, roots and stems of *A. salutaris* and identified.

9205-3247 Melek, F.R., Radwan, A.S., El-Ansari, M.A., El-Gindi, O.D., Hilal, S.H., Genenah, A.A. (National Research Center, Cairo, Egypt) **Diterpenes from *Stachys aegyptiaca*.** *Fitoterapia*, v. 63(3): p. 276, 1992 (3 ref, Eng).

Stachysolone and stachysolone-3-acetate have been isolated from *S. aegyptiaca* and identified.

9205-3248 Menkovic, N., Ristic, M., Samardzic, Z., Savin, K., Kovacevic, N. (Institute for Medical Plant Research Dr Josif Pancic, Belgrade, Yugoslavia) **The essential oil of *Sideritis scardica*.** *Planta Medica*, v. 57(Supplement 2): p. A137-A138, 1991 (5 ref, Eng).

Of 62 components isolated from the essential oil of *S. scardica*, 28 have been identified.

9205-3249 Merfort, I. (Institut für Pharmazeutische Biologie der Heinrich-Heine-Universität Düsseldorf, 4000 Düsseldorf, Germany) **Caffeoylquinic acids from flowers of *Arnica montana* and *Arnica chamissonis*.** *Phytochemistry*, v. 31(6): p. 2111-2113, 1992 (12 ref, Eng).

Two caffeoylquinic acids were isolated from flowers of *A. montana* and three from *A. chamissonis* ssp. *foliosa* var. *incana*. Their structures were established on the basis of spectral data (UV, ¹H NMR, ¹³C NMR, FABMS) as 1,4,5-tri-O-caffeoylquinic acid, 1,5-di-O-caffeoylquinic acid and 3,4,5-tri-O-caffeoylquinic acid methyl ester. The first compound is a new natural product.

9205-3250 Mimaki, Y., Sashida, Y., Kawashima, K. (Tokyo College of Pharmacy, 1432-1, Horinouchi, Hachioji, Tokyo 192-03, Japan) **New steroidal constituents of the bulbs of**

***Camassia cusickii* Wats.** *Chemical & Pharmaceutical Bulletin*, v. 40(1): p. 148-152, 1992 (8 ref, Eng).

Seven new steroidal compounds were isolated from the fresh bulbs of *C. cusickii*. Their structures were determined by spectroscopic analysis and hydrolysis to be (25R)-5alpha-spirostan-3beta, alpha-diol (chlorogenin) 6-O-beta-D-xylopyranosyl-(1 to 3)-beta-D-glucopyranoside, chlorogenin 6-O-beta-D-xylopyranosyl-(1 to 2)-O-{beta-D-glucopyranosyl(1 to 3)}-beta-D-glucopyranoside, chlorogenin 6-O-beta-D-glucopyranosyl-(1 to 2)-O-{beta-D-xylopyranosyl-(1 to 3)}-beta-D-glucopyranoside, chlorogenin 6-O-beta-D-fucopyranosyl-(1 to 2)-O-{beta-D-glucopyranosyl-(1 to 3)}-beta-D-glucopyranoside, 22-O-methyl-26-beta-D-glucopyranosyl-(25R)-5alpha-furostan-3beta, 6alpha, 22-triol 6-O-beta-D-glucopyranosyl-(1 to 3)-beta-D-glucopyranoside, 22-O-methyl-26-O-beta-D-glucopyranosyl-(25R)-5alpha-furostan-3beta, 6alpha, 22-triol 6-O-beta-D-glucopyranosyl-(1 to 2)-O-{beta-D-glucopyranosyl-(1 to 3)}-beta-D-glucopyranoside and 3beta, 7beta, 16beta-trihydroxycholest-5-en-23-one, 3,16-bis-O-beta-D-glucopyranoside (camassioside).

9205-3251 Mimaki, Y., Ishibashi, N., Ori, K., Sashida, Y. (Tokyo College of Pharmacy, 1432-1, Horinouchi, Hachioji, Tokyo 192-03, Japan) **Steroidal glycosides from the bulbs of *Lilium dauricum*.** *Phytochemistry*, v. 31(5): p. 1753-1758, 1992 (16 ref, Eng).

The bulbs of *L. dauricum* yielded 11 compounds, including six new steroidal glycosides. The structures have been determined by spectral analysis and hydrolysis to be (25R,26R)-26-methoxyspirost-5-en-3beta-ol 3-O-alpha-L-rhamnopyranosyl-(1 to 2)-O-{alpha-arabinopyranosyl-(1 to 3)-beta-D-glucopyranoside, (25R,26R)-26-methoxyspirost-5-en-3beta-ol 3-O-alpha-L-rhamnopyranosyl-(1 to 2)-O-{beta-D-glucopyranosyl-(1 to 4)}-beta-D-glucopyranoside, (25R)-spirost-5-en-3beta-ol (diosgenin) 3-O-alpha-L-rhamnopyranosyl-(1 to 2)-O-{alpha-L-arabinopyranosyl-(1 to 3)-beta-D-glucopyranoside, (25R)-3beta,17alpha-dihydroxy-5alpha-spirostan-6-one 3-O-alpha-L-rhamnopyranosyl-(1 to 2)-beta-D-glucopyranoside, (25R)-3beta,17alpha-dihydroxy-5alpha-spirostan-6-one 3-O-alpha-L-rhamnopyranosyl-(1 to 2)-O-{alpha-L-arabinopyranosyl-(1 to 3)}-beta-D-glucopyranoside and (20R,22R)-3beta,20,22-trihydroxy-5alpha-cholestan-6-one (tenuifolliol) 3-O-L-rhamnopyranosyl-(1 to 2)-beta-D-glucopyranoside.

9205-3252 Misra, T.N., Singh, R.S., Pandey, H.S., Singh, S. (Natural Products Research Laboratory, Department of Chemistry, University of Gorakhpur, Gorakhpur 273009, UP, India) **Long-chain compounds from *Leucas aspera*.** *Phytochemistry*, v. 31(5): p. 1809-1810, 1992 (11 ref, Eng).

Two new long-chain compounds, 1-hydroxytetraatriacontan-4-one and 32-methyl-tetraatriacontan-8-ol, along with dotriacontanol have been isolated from shoots of *L.aspera* and characterized by spectral data and chemical studies.

9205-3253 Miyase, T., Kohsaka, H., Ueno, A. (School of Pharmaceutical Sciences, University of Shizuoka, 395, Yada, Shizuoka 422, Japan) **Tragopogonosides A-I, oleanane saponins from *Tragopogon pratensis*.** *Phytochemistry*, v. 31(6): p. 2087-2091, 1992 (4 ref, Eng).

Nine new triterpenic saponins, named tragopogonosides A-I, were isolated from the whole plants of *T.pratensis*, together with five known triterpenic glycosides. The structures of these saponins were determined on the basis of spectral and chemical evidence.

9205-3254 Miyazawa, M., Yamamoto, K., Kameoka, H. (Department of Applied Chemistry, Faculty of Science & Engineering, Kinki University, Kowakae, Higashiosaka-shi, Osaka 577 Japan) **Essential oil of *Erigeron canadensis* L..** *Journal of Essential Oil Research*, v. 4(3): p. 227-230, 1992 (7 ref, Eng).

The composition of the essential oil of *E.canadensis* (Syn. *Conyza canadensis*) growing in west Japan has been investigated by capillary GC and GC/MS. The oil was found to contain 47 volatile components of which 91.0 percent were terpenoid. The main constituents were limonene (31.2 percent), camphene (14.2 percent) and germacrene D (11.3 percent) accounting for 56.7 percent of the oil. Non-terpenoid acetylenic compounds have also been detected.

9205-3255 Mizuno, M., Kojima, H.*, Iinuma, M., Tanaka, T. (Gifu Pharmaceutical University, 6-1 Mitahora-higashi 5 Chome, Gifu 502, Japan) **Chemical constituents and their variations among *Coptis* species in Japan.** *Shoyakugaku Zasshi*, v. 46(1): p. 42-48, 1992 (13 ref, Eng, Jap).

The minor constituents isolated were; 7-(10'-hydroxygeranyl)-scopoletin-10'-glycoside (12) from the whole plants of *C.trifolia*, fraxin (13), feruloyl quinic acid, and beta-sitosterol from the seeds of *C.japonica* var. *dissecta*, and noroxyhydrastinine (14) from the whole plant of *C.quinquefolia*. The amounts of coumarin derivatives and alkaloids in the aerial and underground parts and the seeds were also analyzed. The species of the subgenus *Metacoptis* contained protoberberine alkaloids such as berberine (1) and jatrorrhizine (2). Sanguinarine (10) and dihydrosanguinarine (II) were characteristically present in the seeds of the plants of the section *Chrysocoptis* 13 in the seeds of *C.japonica* and groenlandicine (5), 14 and other protoberberine alkaloids in the whole plant of *C.quinquefolia*. In the underground parts of *C.trifolia* of the subgenus *Chryza*,

7-(10'-hydroxygeranyl)-scopoletin-10'-O-glycosides (8,9,12), 5 and epiberberine (6) were the major components. These chemotaxonomical results obtained in the present study generally agreed with the morphological and taxonomical classifications.

9205-3256 Moulis, C., Fouraste, I., Bon, M. (Laboratoire de Pharmacognosie, UFR des Sciences Pharmaceutiques, Universite Toulouse III, 31 allees Jules-Guesde F-31 400, Toulouse, France) **Levatin, an 18-norclerodane diterpene from *Croton levatii*.** *Journal of Natural Products*, v. 55(4): p. 445-449, 1992 (8 ref, Eng).

A new ent-norclerodane diterpenoid named levatin (C₁₉H₂₀O₅; mp 197 degree) was isolated from the stem bark of *Croton levatii*. Its structure was elucidated by means of 2D NMR experiments as ent-15,16-epoxy-18-norcleroda-8(17),13(16),14-triene-19,3:20,12S-diolide.

9205-3257 Naito, T., Niitsu, K., Ikeya, Y., Okada, M., Mitsuhashi, H. (Research Institute for Biology and Chemistry, Tsumura and Co. 3586 Yoshiwara, Ami-machi, Inashiki-gun, Ibaraki 300-11, Japan) **A phthalide and 2-farnesyl-6-methyl benzoquinone from *Ligusticum chuangxiong*.** *Phytochemistry*, v. 31(5): p. 1787-1789, 1992 (8 ref, Eng).

A new phthalide, senkyunolide Q, and 2-farnesyl-6-methyl benzoquinone, senkyunone, along with senkyunolide M, 2-methoxy-4-(3-methoxy-1-propenyl)-phenol and 2-(1-oxo-pentyl)benzoic acid methyl ester were isolated from the rhizome of *Ligusticum chuangxiong*. On the basis of spectral analyses and chemical methods, the structures of senkyunolide Q, and senkyunone were proved to be (6R,7S)-3-butylidene-4,5,6,7-tetrahydro-7hydroxy-6-(1-oxobutyl)-phthalide and (2'E,6'E)-2-farnesyl-6-methyl-p-benzoquinone, respectively.

9205-3258 Namba, O., Yoshida, T., Lu, C.F., Yang, L.L., Yen, K.Y., Okuda, T. (Faculty of Pharmaceutical Sciences, Okayama University, Tsushima, Okayama 700, Japan) **Antidesmin A: A new dimeric ellagitannin from *Antidesma pentandrum*.** *Planta Medica*, v. 57(Supplement 2): p. A125-A126, 1991 (5 ref, Eng).

Structures of two hydrolyzable tannins, carpinusin and a novel dimer, named antidesmin isolated from *A.pentandrum* were elucidated on the basis of spectral analyses and chemical degradation.

9205-3259 Nath, S.C., Kanjilal, P.B., Bordoloi, D.N. (Division of Medicinal and Economic Plants, Regional Research Laboratory, Jorhat 785 006, Assam, India) **Evaluation of germplasm of native *Cymbopogon***

citratus (DC) Stapf. *Pafai Journal*, v. 14(1): p. 29-30, 1992 (1 ref, Eng).

Seven non-flowering accessions of *C.citratus* collected from different eco-climatic areas of N-Eastern India were evaluated for growth performance, oil yield and citral contents alongwith local control of non-flowering habit. Of these accessions RRL J=1180 was found to possess significant yield attributing traits. It produced herb and oil yield of 53'77 tons and 376'36 kg respectively per hectare per annum and hence appeared to be suitable for commercial plantation. NSL, New Delhi.

9205-3260 Neszmelyi, A., Milne, G.W.A. , Hethelyi, E.(Central Research Institute for Chemistry, 59 Pusztaszeri ut, H-1025 Budapest, Hungary) **Composition of the essential oil of clone 409 of *Tanacetum vulgare* and 2D NMR investigation of trans-chrysanthenyl acetate.** *Journal of Essential Oil Research*, v. 4(3): p. 243-250 , 1992 (22 ref, Eng).

The essential oil from clone 409 of *T.vulgare* contains trans-chrysanthenyl acetate (75 percent) and trans-chrysanthenol (5-10 percent). The composition was determined by GC, GC/MS, 1H- and 13C-NMR spectroscopy. The structures of the main components were established by two-dimensional NMR techniques. Unambiguous assignment of all chemical shifts was achieved and coupling constants of diagnostic interest were determined.

9205-3261 Nia, M.A., Gunasekar, D.(Department of Chemistry, Sri Venkateswara University, Tirupati 517 502, AP, India) **A new isoflavone from the root bark of *Ochna squarrosa*.** *Fitoterapia*, v. 63(3): p. 249-250, 1992 (10 ref, Eng).

The root bark of *O.squarrosa* was found to contain a new isoflavone (C₁₉H₁₆O₇, mp 181-82 degree) which has been identified on the basis of spectral and chemical studies as 5,7,8-trimethoxy-3',4'-methylenedioxyisoflavone.

9205-3262 Nia, M.A., Sreeramulu, K. , Gunasekar, D.(Department of Chemistry, Sri Venkateswara University, Tirupati 517 502, AP, India) **Constituents of *Rhynchosia bracteata* and *R.sublobata* leaves.** *Fitoterapia*, v. 63(3): p. 283-284, 1992 (2 ref, Eng).

Orientin (0.001 percent), isoorientin (0.01), vitexin (0.006), isovitexin (0.004), vicenin-2 (0.002) and lucenin-2 (0.001) have been isolated from the dried leaves of *R.bracteata* and *R.sublobata* and identified.

9205-3263 Niyonzima, G., Pieters, L., Balde, A.M., Claeys, M., Laekeman, G.M., Vlietinck, A.J.(Department of Pharmaceutical Sciences, University of Antwerp, B-2610 Antwerp, Belgium) **Isolation of 6-O-caffeoylcatalpol and**

some other compounds from *Spathodea campanulata*. *Planta Medica*, v. 57(Supplement 2): p. A85, 1991 (6 ref, Eng).

The isolation of atranorin, vanillic acid, ferulic acid and 6-O-caffeoylcatalpol (verminoside) from the stem bark of *S.campanulata* has been reported. Atranorin, a common lichen acid and other compounds were identified by H-NMR, 13C NMR and EI-mass spectrometry.

9205-3264 Nkunya, M.H.H., Weenen, H., Kinabo, L.S.(Department of Chemistry, University of Dar es Salaam, P O 35061, Dar es Salaam, Tanzania) **Constituents of *Artemisia afra*.** *Fitoterapia*, v. 63(3): p. 279-280, 1992 (11 ref, Eng).

Taurin {1-oxo-6,11beta(H)-endesm-4-en-6,12-olide}, 6-triacontanone, 5-hydroxy-7,4'-dimethoxyflavone and 4-methylbenzoic acid have been isolated from the aerial parts and roots of *A.afra* and identified.

9205-3265 Oechslin, M., Konig, G.M. , Oechslin-Merkel, K., Wright, A.D., Khan, I.A., Miyagawa, M., Sticher, O.(Department of Pharmacy, Swiss Federal Institute of Technology(ETH) Zurich, CH-8092 Zurich, Switzerland) **Four new benzophenanthridine alkaloids from *Bocconia integrifolia*.** *Planta Medica*, v. 57(Supplement 2): p. A104-A105 , 1991 (3 ref, Eng).

Four new derivatives of dihydrosanguinarine or dihydrochelerythrine have been isolated from *B.integrifolia* and identified. A known compound 6-acetonyl-dihydrochelerythrine was also isolated and identified.

9205-3266 Oechslin-Merkel, K., Konig, G.M. , Oechslin, M., Miyagawa, M., Wright, A.D., Sticher, O.(Department of Pharmacy, Swiss Federal Institute of Technology (ETH) Zurich, CH-8092 Zurich, Switzerland) **A new glycoside from *Sobralia violacea* related to phytoalexins from orchids.** *Planta Medica*, v. 57(Supplement 2): p. A126, 1991 (4 ref, Eng).

Petroleum ether extract of *S.violacea* aerial parts, yielded loroglossol while dichloromethane extract yielded hircinol, orchinol and a bibenzyl derivative. Ethyl acetate extract afforded known lusianthridin while a new compound, 7-O-{6-O-(beta-D-apiofuranosyl)- beta-D-glucopyranosyl}orchinol was obtained from the methanol extract.

9205-3267 Ohtani, K., Ogawa, K., Kasai, R. , Yang, C.R., Yamasaki, K., Zhou, J. , Tanaka, O.(Institute of Pharmaceutical Sciences, Hiroshima University School of Medicine, Kasumi Minami-ku, Hiroshima 734, Japan) **Oleanane glycosides from *Glycyrrhiza yunnanensis***

roots. *Phytochemistry*, v. 31(5): p. 1747-1752, 1992 (12 ref, Eng).

From the roots of *G.yunnanensis*, six new oleanane-type triterpene glycosides named yunganosides A1, B1, C1, D1, E2 and F2 were isolated together with hypaphorine. The structures of these glycosides were established by spectroscopic and chemical means.

9205-3268 Ohtani, K., Aikawa, Y., Kasai, R., Chou, W.H., Yamasaki, K., Tanaka, O. (Institute of Pharmaceutical Sciences, Hiroshima University School of Medicine, Kasumi, Minami-ku, Hiroshima 734, Japan) **Minor diterpene glycosides from sweet leaves of *Rubus suavissimus*.** *Phytochemistry*, v. 31(5): p. 1553-1559, 1992 (28 ref, Eng).

From sweet leaves of *Rubus suavissimus*, 10 new kaurane-type diterpene glycosides named suaviosides were isolated, in addition to the known major sweet glycoside, rubusoside and several known minor glycosides. Of these minor glycosides, suaviosides B, G, H, I and J taste sweet, and suaviosides C1, D2 and F taste bitter, while suaviosides D1 and E are tasteless. Their structures were determined mainly on the basis of NMR spectral evidence.

9205-3269 Onayade, O.A., Scheffer, J.J.C., Baerheim Svendsen, A., Gbile, Z.O. (Division of Pharmacognosy, Obafemi Awolowo University, Ife-Ife, Nigeria) **Lavender lactone and other volatile constituents of the oleoresin of *Garcinia kola* seeds.** *Planta Medica*, v. 57(Supplement 2): p. A86-A87, 1991 (1 ref, Eng).

The composition of the volatiles obtained from the distilled-extracted oleoresin of a commercial sample of seeds of *G.kola* growing wild in Nigeria was analysed by means of GLNC, LSC and GC-MS. The volatiles consisted mainly of terpenes as, aldehydes (10 percent), ketones (14 percent), alcohols (35 percent), oxygen-containing monoterpenes (40 percent), oxygen-containing sesquiterpenes (14 percent) and diterpenes (4 percent). The major components of the volatiles were 6-methyl-5-hepten-2-one (13.9 percent), beta-farnesol (12.3 percent), 5-ethenyldihydro-5-methylfuran-2-one (=lavender lactone, 10.4 percent) and linalool (9.9 percent). Tributyl phosphate and phthalates constituted about 10 percent of the volatiles detected in a commercial sample of *G.kola*.

9205-3270 Orjala, J., Erdelmeier, C.A.J., Wright, A.D., Rali, T., Sticher, O. (Department of Pharmacy, Swiss Federal Institute of Technology (ETH) Zurich, CH-8092 Zurich, Switzerland) **Two new dihydrochalcones from *Piper aduncum* leaves.** *Planta Medica*, v. 57(Supplement 2): p. A79-A80, 1991 (5 ref, Eng).

The isolation of two new dihydrochalcones and methylindaretin has been reported from *P.aduncum*. The

structure determination was based on spectroscopic data: E1- and FAB-mass, UV, IR and mainly on NMR studies compound (methylindaretin) showed a weak antibacterial activity against *Bacillus subtilis* at the level of 10.3 micro/g.

9205-3271 Pabst, A., Barron, D., Semon, E., Schreier, P.* (Lehrstuhl für Lebensmittelchemie, Universität Würzburg, Am Hubland, 8700 Würzburg, Germany) **An alpha-ionol disaccharide glycoside from raspberry fruit.** *Phytochemistry*, v. 31(6): p. 2043-2046, 1992 (13 ref, Eng).

From a methanolic extract of raspberry *Rubus idaeus* fruit the 9-O-alpha-L-arabinofuranosyl-(1 to 6)-beta-D-glucopyranoside of (6R,9R)-alpha-ionol was isolated. Its structure was established on the basis of ¹H and ¹³C NMR spectroscopy. The absolute configuration of the aglycone was determined by direct chiral analysis using MDGC-mass spectrometry as well as ¹H NMR analysis of its (R)-(-)-alpha-phenylpropionic acid ester.

9205-3272 Pabst, A., Barron, D., Semon, E., Schreier, P. (Lehrstuhl für Lebensmittelchemie, Universität Würzburg, Am Hubland, 8700 Würzburg, Germany) **Two diastereomeric 3-oxo-alpha-ionol-beta-D-glucosides from raspberry fruit.** *Phytochemistry*, v. 31(5): p. 1649-1652, 1992 (17 ref, Eng).

From a methanolic extract of raspberry *Rubus idaeus* fruit two 3'-O-beta-D-glucopyranosides of diastereomeric 4-(3'-hydroxy-1'-butenyl)-3,5,5-trimethyl-2-cyclohexen-1-one(3-oxo-alpha-ionol) were isolated by adsorption chromatography on XAD-2 followed by LC on Sephadex LH-20, MPLC on RP-18, and flash chromatography on silica gel as well as by HPLC on diol and RP-18 phases. Their structures were determined by ¹H and ¹³C NMR spectroscopy.

9205-3273 Pachaly, P., Sin, K.S., Barion, J. (Pharmazeutisches Institut der Universität Bonn, Kreuzbergweg 26, D-5300 Bonn, Federal Republic of Germany) **New iridoids from *Scrophularia koraiensis*.** *Planta Medica*, v. 57(Supplement 2): p. A87-A88, 1991 (1 ref, Eng).

In addition to the three known compounds aucubin, harpagosid, and harpagid, three new iridoids called scrophenaside I, II, III were isolated from the roots of *S.koraiensis* by HPLC on silica gel and reversed phase material DCCC. The structures were elucidated by spectroscopic and chemical methods.

9205-3274 Pallenbach, E., Scholz, E., König, M., Hunkler, D., Rimpler, H. (Institut für Pharmazeutische Biologie, Universität Freiburg, D-7800 Freiburg, FRG) **Proan-**

thocyanidins from *Quercus petraea* bark. *Planta Medica*, v. 57(Supplement 2): p. A127, 1991 (6 ref, Eng).

Catechin 4 α -benzylthioether, epicatechin 4-beta-benzylthioether, gallocatechin 4-beta-benzylthioether, epicatechin-3-gallate 4-beta-benzyl thioether, epigallocatechin-3-gallate 4-beta-benzyl thioether and the hitherto unknown 5,7,3',5'-tetrahydroxyflavan-3-beta-ol 4-beta-benzylthioether, catechin and gallocatechin were obtained as free flavanols. The structures of the thiolysis products were elucidated.

9205-3275 Pant, A.K., Mathela, C.S., Vasu Dev, Bottini, A.T. (Department of Chemistry, G.B. Agricultural University, Pantnagar 263 145 UP, India) **Rhizome essential oil of *Hedychium aurantiacum* (Zingiberaceae), a potential source of (+)-linalool.** *Journal of Essential Oil Research*, v. 4(2): p. 129-131, 1992 (7 ref, Eng).

The essential oil from rhizomes of *H.aurantiacum* was found to consist largely of (+)-linalool (80.6 percent) and monoterpene hydrocarbons (16.0 percent). The composition of the oil differs markedly from the rhizome essential oil obtained from *H.spicatum* var. *acuminatum* (*H.acuminatum*), a plant which closely resembles *H.aurantiacum*.

9205-3276 Pepalla, S.B., Jammula, S.R., Jagannadha Rao, K.V., Thomson, R.H. (Department of Chemistry, Nagarjuna University, Nagarjun Nagar 522,510, India) **Quinones and tetracosanolide in *Ventilago bombaiensis*.** *Phytochemistry*, v. 31(6): p. 2103-2104, 1992 (17 ref, Eng).

Seventeen compounds have been isolated from the acetone extract of the stem bark of *V.bombaiensis*. They were identified as chrysophanol, 10-(chrysophanol-7'-yl)-10-hydroxychrysophanol-9-anthrone, chrysophanol 8-methyl ether, citreorosein, emodin, emodin 1-O- α -L-rhamnopyranoside, islandicin, physcion, physcion 8-methyl ether, ventiloquinone C, ventiloquinone-O, xanthorin, calyxanthone, lupeol, beta-sitosterol, sitosterol 3-O-beta-D-glucoside and tetracosanolide by spectral data and by comparison with authentic samples.

9205-3277 Pezzuto, J.M., Mar, W., Lin, L.Z., Cordell, G.A., Neszmelyi, A., wagner, H. (Department of Medicinal Chemistry and Pharmacognosy and Program for Collaborative Research in the Pharmaceutical Sciences, College of Pharmacy, University of Illinois at Chicago, Chicago, Illinois) **Budmunchiamines D-1 from *Albizia amara*.** *Phytochemistry*, v. 31(5): p. 1795-1800, 1992 (11 ref, Eng).

Extracts prepared from the seeds of *A.amara* were found to demonstrate an interaction with DNA. On the basis of this interaction, six new spermine macrocyclic alkaloids, budmunchiamines D-1, were isolated. The structures of

these substances were determined by spectral analysis and comparison with the related alkaloids, budmunchiamines A-C.

9205-3278 Piacente, S., Aquino, R., de Tommasi, N., de Ugaz, O.L., Orellana, H.C. (Dipartimento di Chimica delle Sostanze Naturali, Universita degli Studi di Napoli 'Federico II', via D. Montesano 49-80131 Napoli, Italy) **p-Hydroxyacetophenone derivatives from *Werneria ciliolata*.** *Phytochemistry*, v. 31(6): p. 2182-2184, 1992 (11 ref, Eng).

The reinvestigation of aerial parts of *W.ciliolata* afforded, in addition to known benzofurans (toxol and toxyl acetate) two new p-hydroxyacetophenone derivatives. The structures were elucidated by spectroscopic methods. The chemotaxonomic relevance is discussed briefly.

9205-3279 Pinto, A.C., Raquel Figueiredo, M., de A. Epifanio, R. (Instituto de Quimica, Universidade Federal do Rio de Janeiro, Centro de Tecnologia, Bloco A, Cidade Universitaria, Ilha do Fundao 21910, Rio de Janeiro, RJ, Brazil) **Diterpenes from *Vellozia patens*.** *Phytochemistry*, v. 31(5): p. 1681-1686, 1992 (11 ref, Eng).

Eight new diterpenes with isopimarane skeleton have been isolated from *V.patens*. Their structures were elucidated by spectroscopic methods and by chemical transformations.

9205-3280 Pinto, A.C., de A Epifanio, R., Pizzolatti, M., Rezende, C.M., Silva, B.R. (Instituto de Quimica, Universidade Federal do Rio de Janeiro, Centro de Tecnologia, Bloco A, Cidade Universitaria, Ilha do Fundao 21910, Rio de Janeiro, RJ, Brazil) **Two norditerpenes with an isopimarane skeleton from *Vellozia variabilis*.** *Phytochemistry*, v. 31(5): p. 1679-1680, 1992 (3 ref, Eng).

Two new diterpenes have been isolated from *Vellozia variabilis*, and their structures elucidated by spectroscopic methods.

9205-3281 Ponglux, D., Wongseripipatana, S., Aimi, N.*, Oya, N., Hosokawa, H., Haginiwa, J., Sakai, S.I. (Faculty of Pharmaceutical Sciences, Chiba University, 1-33 Yayoi-cho, Chiba 260, Japan) **Structures of two new bitter principles isolated from a Thai medicinal plant, *Vernonia extensa* DC.** *Chemical & Pharmaceutical Bulletin*, v. 40(2): p. 553-555, 1992 (11 ref, Eng).

From the Thai medicinal plant, *V.extensa*, two sterol glucosides, VE-1 and VE-2, were isolated. Their structures were proved to be closely related to the new class of bitter principles recently found in an African species of *Vernonia*.

9205-3282 Potterat, O., Hostettmann, K.* , Stoeckli-Evans, H., Saadou, M. (Institut de Pharmacognosie et Phytochimie, Ecole de Pharmacie de l'Université de Lausanne, BEP, CH-1015 Lausanne, Switzerland) **Saponins with an unusual secoursene skeleton from *Sesamum alatum* Thonn.** *Helvetica Chimica Acta*, v. 75(3): p. 833-841, 1992 (20 ref, Eng).

Three new saponins, alatoside A-C, with a 18,19-secours-12-ene skeleton have been isolated from the aerial parts of *S. alatum* by preparative liquid chromatography. Their structures were elucidated by spectroscopic methods, including X-ray diffraction analysis, and by chemical degradation (acidic and enzymatic hydrolyses). Verbascoside and two cyclohexylethanol derivatives, rengyol and isorengyol, have also been isolated and identified.

9205-3283 Pukl, M., Umek, A. (Department of Pharmacy, Faculty of Natural Sciences and Technology, University of Ljubljana, Askerceva 9, 61000 Ljubljana, Yugoslavia) **Pentacyclic triterpenes from *Rubia peregrina* leaves.** *Fitoterapia*, v. 63(3): p. 284, 1992 (3 ref, Eng).

Rubifolic acid, ursolic acid, oleanolic acid, and betasitosterol were isolated from the dried leaves of *R. peregrina* and identified.

9205-3284 Qian, Y.W., Tan, F.L., Qi, Z.W. , Chi, C.W. (Shanghai Institute of Biochemistry, Academia Sinica, Shanghai 200031, China) **Studies on natural and modified peptide *Trichosanthes* trypsin inhibitors.** *Science in China*, v. 33B(5): p. 599-605, 1990 (15 ref, Eng).

A peptide trypsin inhibitor was isolated and purified from the roots of *T. kirilowii* (a Chinese medical herb) by using immobilized anhydro-trypsin affinity chromatography and HPLC C18 column reverse chromatography. It was found to contain two major components, both consisting of 27 amino acid residues with three pairs of disulfide bonds. The sequence determination indicated that the difference between them is only in the ninth position, being Gln and Lys, respectively. It might be the smallest naturally occurring protein inhibitor so far known. The modification reaction of the *Trichosanthes* inhibitor with trypsin was similar to the catalytic enzyme-substrate reaction. The dissociation constant of the modified inhibitor with trypsin was fourfold that of the natural inhibitor.

9205-3285 Qin, G., Xu, R. (Shanghai Institute of Materia Medica, Academia Sinica, Shanghai 200031, People's Republic of China) **Studies on the chemical constituents of *Gardenia jasminoides*.** *Planta Medica*, v. 57(Supplement 2): p. A75, 1991 (2 ref, Eng).

From ethyl acetate extracts of the flowers of *G. jasminoides* geniposide, 10-acetyl-geniposide, daucosterol,

and a new flavanoid named zhizinin A were isolated. Zhizinin was shown to be a flavone with four hydroxy and two methoxy groups. Alkaline degradation of it afforded two products which were identified as 2-hydroxy-3,4-dimethoxybenzoic acid and 2-hydroxy-3,4-dimethoxyacetophenone.

9205-3286 Rakotoarimanga, J.V., Krebs, H.C., Habermehl, G., Rasoanaivo, P., Ratsimamanga-urverg, S., Rakoto-Ratsimamanga, A. (Chemisches Institut der Tierärztlichen Hochschule, Bischofsholer Damm, 15, D-3000 Hannover 1, Germany) **Constituents of *Vernonia glutinosa*.** *Fitoterapia*, v. 63(3): p. 271-272, 1992 (7 ref, Eng).

Cynaropicrin, desacylcynaropicrin and 3-O-methyl quercetin have been isolated from the aerial parts of *V. glutinosa* and identified.

9205-3287 Ramachandraiah, O.S., Azeemoddin, G. , Thirumala Rao. S.D., Padmakumari, K.P. , Narayana, C.S. (Oil Technological Research Institute, Anantpur 515 001, AP, India) **Composition of essential oil from flower buds of "Nagakesar" (*Mammea longifolia*, Planch).** *Pafai Journal*, v. 14(1): p. 33-34, 1992 (2 ref, Eng).

Extraction of flower buds of *M. longifolia* followed by steam distillation yielded oleoresin (1.2 percent of essential oil). The chemical constituents of the oils are sesquiterpene hydrocarbons (30.56 percent), guaiene (12.7 percent) linabrol (7.3 percent) elemol (6.28 percent) alpha copaene (3.36 percent) beta caryophyllene (1.39 percent) alpha-pinene (0.92 percent) camphene (0.41 percent) limonene (0.61 percent) and pcymene (0.34 percent). The physico chemical characteristics of the oil are given. NSL, New Delhi.

9205-3288 Ramachandraiah, P., Adinarayana, D. , Rao, R.J., Monache, F.D. (Department of Chemistry, SV Arts College, Tirupati 517502, AP, India) **Occurrence of 6a, 12a-dehydroamorphigenin in *Dalbergia paniculata* seeds.** *Indian Journal of Chemistry*, v. 31B(7): p. 472, 1991 (3 ref, Eng).

Isolation and identification of 6a,12a-dehydroamorphigenin along with 6a,12a-dehydrodalpanol from the seeds has been given Delhi.

9205-3289 Ramesh, D., Dennis, T.J., Shingare, M.S. (Department of Chemistry, Marathwada University, Aurangabad 431 003, Maharashtra, India) **Constituents of *Adansonia digitata* root bark.** *Fitoterapia*, v. 63(3): p. 278-279, 1992 (6 ref, Eng).

Linolenic acid (2.299 percent); linoleic acid (9.225); oleic acid (50.894); stearic acid (9.319), palmitic acid

(20.164), beta-amyrin and beta-sitosterol have been isolated from the root oil and identified.

9205-3290 Ramesh, R., Yuvarajan, C.R. (Department of Natural Products, School of Chemistry, Madurai Kamaraj University, Madurai 625 021, TN, India) **Flavonoids of *Striga lutea***. *Indian Journal of Heterocyclic Chemistry*, v. 1(5): p. 259-260, 1992 (10 ref, Eng).

From the aerial parts of *S. lutea*, a rare flavone methyl ester 7,4'-dimethylscutellarein has been isolated along with epigenin, luteolin and beta sitosterol. NSL, New Delhi.

9205-3291 Rao, A.S. (Institut de Biologie et de Physiologie-Vegetales del 'Universite 1015-Lausanne, Switzerland) **Root flavonoids**. *Botanical Review*, v. 56(1): p. 1-84, 1990 ((Recd. 1991); 547 ref, Eng).

Information on root flavonoids have been extensively reviewed and their functional diversity critically appraised. An exhaustive list of flavonoids which are of therapeutic/pharmaceutical significance has been compiled. Role of flavonoids in allelopathic activity, plant protection, nutrient uptake, root growth regulation and flavonoid production from root cultures have also been discussed.

9205-3292 Rao, J.R., Ahamed, M.A. (Department of Chemistry, Sri Venkateswara University, Post Graduate Centre, Cuddapah, 516 004, AP, India) **Phytochemical study of *Dalbergia paniculata* leaves**. *Fitoterapia*, v. 63(2): p. 187, 1992 (20 ref, Eng).

Light petrol extraction yielded triacontanol (0.01 percent) and beta-sitosterol (0.013). Acetone extraction gave (+)-pinitol (0.018 percent), apigenin (0.00125), luteolin (0.0015) and 7-O-glucosylcaviunin (0.0035). Methanol extraction yielded 4',7-di-O-glucosylapigenin which on methylation followed by acid hydrolysis gave 5-O-methylapigenin.

9205-3293 Rao, J.T., Sreelaxmi, U. (Dr H.S. Gour University, Sagar, MP, India) **Studies on the essential oil of *Melissa parviflora***. *Parfumerie und Kosmetik*, v. 73(3): p. 154-156, 1992 (4 ref, Eng).

A light yellow coloured essential oil (yield 2 percent) isolated from the aerial parts of *M. parviflora* has been found to be a good source of monoterpenic alcohols and aldehydes. The oil contains d-camphene (2.5 percent), dl-alpha-pinene (2.3), 1-beta-pinene (2.12), delta-3-carene (2.05), d-limonene (12.95), azulene (1.26), linalool (13.36), 1.8-cineole (9.33), citronellal (4.0), citronellol (8.2), citral (13.0), geraniol (21.01), nepatalactone (1.91), thymol (4.0) and citronellic acid (2.0 percent).

9205-3294 Rasool, N., Ahmad, V.U., Malik, A. (H E J Research nInstitute of Chemsitry, University of Karachi, Karachi 75270, Pakistan) **Two new triterpenoids from *Pentatropis spiralis***. *Fitoterapia*, v. 63(2): p. 156-159, 1992 (14 ref, Eng).

Two new triterpenes pentatronol (C₃₀H₅₂O; mp 238-40 degree) and pentatropeline (C₄₆H₈₀O₂) have been isolated from *P. spiralis*.

9205-3295 Rauwald, H.W., Niyonzima, D.D. (Institut fur Pharmazeutische Biologie, Johann Wolfgang Goethe-Universitat Frankfurt, Georg Voigt Strasse 16, D-6000 Frankfurt/M.11, Federal Republic of Germany) **Free and cinnamoylated 8-O-methyl-7-hydroxyaloin from *Aloe barbadensis*: Isolation, structure, and configurational determination of the diastereomers**. *Planta Medica*, v. 57(Supplement 2): p. A129, 1991 (3 ref, Eng).

Isolation, structure elucidation, and configurational determination of four new compounds of the 7-hydroxyalon-type from official Curacao aloes, namely the 8-O-methyl-7-hydroxyaloin A and B as well as their corresponding 6'-O-cinnamoyl esters have been reported. The diastereomers were separated and isolated by combined TLC and DCCC and the constitutions were elucidated by FAB-mass and ¹H/¹³C-NMR spectroscopy and by hydrolytic studies. For the first time unsubstituted cinnamic acid was found as an esterifying component in aloin-type glycosyls. The esterified compounds were predominant in young fresh leaves.

9205-3296 Redl, K., Davis, B., Bauer, R. (Institut fur Phamazeutische Biologie, Universitat Munchen, Karlstr. 29, D-8000 Munchen 2, Federal Republic of Germany) **New polyacetylene glycosides from *Bidens campylothea***. *Planta Medica*, v. 57(Supplement 2): p. A88, 1991 (3 ref, Eng).

Four new polyacetylene glycosides, 2-O-beta-D-glucosyl-trideca-3E,11E-diene-5,7,9-triyn-1,2,13-triol (1), 2-O-beta-D-glucosyl-0-trideca-3E,11E-3E,11E-diene-5,7,9-triyn-1,2-diol (2), 2-O-beta-D-glucosyl-trideca-3E,11Z-diene-5,7,9-triyn-1,2-diol (3) and 2-O-beta-D-glucosyl-trideca-11E-ene-3,5,7,9-tetrayne-1,2-diol (4), were isolated from the methanolic extract of the aerial parts of *B. campylothea* by fractionation. Final purification on RP 18 material afforded 10 mg of compound 1, 5 mg of compound 2, 7 mg of compound 3 and 6 mg of compound 4. The structure elucidation was achieved by UNV, mass, and NMR spectroscopy.

9205-3297 Reher, G. (Lehrstuhl fur Pharmakognosie der Universitat Hamburg, Bundesstrabe 43, D-2000 hamburg 13, Federal Republic of Germany) **The triterpenoid and**

fatty acid pattern of several genera of the rosoideae (Rosaceae). *Planta Medica*, v. 57(Supplement 2): p. A76-A77, 1991 (4 ref, Eng).

A comparative study of triterpene pattern of several species of the *Sanguisorba* group has been performed by TLC and HPLC. The triterpenoids 23 hydroxytormentonic acid ester glucoside and its aglycone 23 hydroxytormentonic acid and tormentonic acid ester glucoside were detected in all the species investigated except *Sanguisorba officinalis* from which 3-O-L-arabinopyranosylpomolic acid ester glucoside and its aglycone 3-O-L-arabinopyranosylpomolic acid were isolated. The fatty acids of most of the Rosaceae were mainly linoleic acid and oleic and that of Rosoideae linolenic glycerides.

9205-3298 Rios, J.L., Manez, S., Paya, M., Alcaraz, M.J.* (Departamento de Farmacologia, Facultad de Farmacia, Avda, Blasco Ibanez 13, 46010 Valencia, Spain) **Antioxidant activity of flavonoids from *Sideritis javalambrensis*.** *Phytochemistry*, v. 31(6): p. 1947-1950, 1992 (18 ref, Eng).

Four isoscutellarein glycosides and hypolaetin-8-glucoside have been isolated from *S.javalambrensis* aerial parts and identified by standard methods. These glycosides have been tested for their antioxidant properties alongside other 7,8-substituted flavonoids using FeSO₄/cysteine-induced microsomal lipid peroxidation. Superoxide scavenging activity was assessed in the nitroblue tetrazolium test. Among this series of flavonoids, hypolaetin-8-glucoside is the most potent inhibitor of non-enzymic lipid peroxidation. The antiperoxidative activity of these flavonoids may be related to their superoxide scavenging ability.

9205-3299 Rios, J.L., Recio, M.C., Giner, R.M., Sanz, M.J., Terencio, M.C., Manez, S. (Departamento de Farmacologia, Facultad de Farmacia, Facultad de Farmacia, Universia de Valencia, Valencia, Spain) **Two new catapol derivatives from *Scrophularia auticulata*.** *Planta Medica*, v. 57(Supplement 2): p. A88-A89, 1991 (4 ref, Eng).

By repeated fractionation different fraction (A-B) were obtained from the air-dried aerial parts of *S.auriculata*. Fraction A yielded compounds 1 and 2. Fraction B yielded 3 and fraction C gave compound 4. Structures were established by spectroscopic methods (UV, ¹H-NMR and ¹³C-NMR). Compounds 1 and 2 are two unidentified iridoids. Compound 3 has been identified as a mixture of two isomers: 3a and 3b. They are two new catalpol phenylpropanoid glycoside derivatives that have been isolated for the first time. Compound 4 was identified as acetoside.

9205-3300 Roder, E., Liang, X.T., Kabus, K.J. (Pharmazeutisches Institut der Universitat Bonn, An der Immenburg 4, D(W)-5300 Bonn 1, Federal Republic of Germany) **Pyrrolizidine alkaloids from the seeds of *Crotalaria sessiliflora*.** *Planta Medica*, v. 58(3): p. 283, 1992 (8 ref, Eng).

Three pyrrolizidine alkaloids including monocrotaline have been isolated from the seeds of the *C.sessiliflora* and characterized by IR, mass, ¹H- and ¹³C-NMR 2 dimensional spectral techniques (HETCOR, COSY).

9205-3301 Rubio, B., Diaz, A.M., Velazquez, M.P., Villaescusa, L. (Lab. Pharmacognosy, Fac. Pharmacy, Universitat Alcala de Henares, Madrid, Spain) **Caffeoyl and flavonoid compounds in *Scolymus hispanicus*.** *Planta Medica*, v. 57(Supplement 2): p. A130, 1991 (3 ref, Eng).

From the pulverized petals of *S.hispanicus*, rosmarinic acid and several flavonoids: luteolin 8-C-glucoside (orientin), quercetin 5-glucoside and isorhamnetin 3-galactoside were isolated. The hydrolysis of rosmarinic acid resulted in two compounds, caffeic acid and dihydroxy-3,4-phenylactic acid.

9205-3302 Rucker, G., Kehrbaum, S., Sakulas, H., Lawong, B., Goeltenboth, F. (Pharmazeutisches Institut, Rheinische Friedrich-Wilhelms-Universitat Bonn, Kreuzbergweg 26, D(W)-5300 Bonn, Federal Republic of Germany) **Acetylenic glucosides from *Microglossa pyrifolia*.** *Planta Medica*, v. 58(3): p. 266-269, 1992 (12 ref, Eng).

From the leaves of *M.pyrifolia* four new acetylenic glucosides (1-4) have been isolated. The aglucones 2a and 4a are new polyynes. The aglucone 3a could only be isolated as a mixture of E/Z-isomers in a ratio of 4:1. The structures of 1-4 were elucidated by spectroscopic and biochemical methods. Compound 1 showed antibacterial activity.

9205-3303 Ruiz, S.O., Guerreiro, E., Giordano, O.S. (Department of Organic Chemistry, Faculty of Chemistry, Biochemistry and Pharmacy, University of San Luis, 5700 San Luis, R. Argentina) **Flavonoids from *Thymophylla belenidium*.** *Fitoterapia*, v. 63(3): p. 276-277, 1992 (5 ref, Eng).

Apigenin (0.04 percent), luteolin (0.01), 7-methyl-luteolin (0.01), nepetin (0.01) and 7-glucosylquercetagetin (0.1) have been isolated from aerial parts of *T.algarbiense*.

9205-3304 Sakamoto, S., Kofuji, S., Kuroyanagi, M., Ueno, A., Sekita, S. (School of Pharmaceutical Sciences, University of Shizuoka, 395 Yada, Shizuoka-shi 422, Japan) **Saponins from *Trifolium repens*.** *Phytochemistry*, v. 31(5): p. 1773-1777, 1992 (15 ref, Eng).

From the whole plant of white clover, *T.repens* (white clover), five new triterpenoid saponins, designated clover-saponins I-V, were isolated together with four known saponins, beta-D-glucuronopyranosylsoyasapogenol B, soyasaponin I, soyasaponin II and azukisaponin II as their methyl esters. Their structures were determined by ¹H NMR and ¹³C NMR spectroscopy and chemical evidence.

9205-3305 Schmeda-Hirschmann, G., Tschritzis, F., Jakupovic, J. (Facultad de Recursos Naturales, Universidad de Talca, Casilla 747, Talca, Chile) **Diterpenes and a lignan from *Jatropha grossidentata***. *Phytochemistry*, v. 31(5): p. 1731-1735, 1992 (3 ref, Eng).

The roots of *J.grossidentata* gave, in addition to the previously described rhamnifolanes, nine further diterpenes of the lathyrane type. Further, a new lignan and known coumarino-lignan were isolated. The structures were elucidated by means of high field NMR spectroscopy.

9205-3306 Selenghe, D., Zhavsan, S., Zhamyansan, Y., Christov, V., Dutschewska, H. (Institute of Organic Chemistry, Mongolian Academy of Sciences, Ulan bator, Mongolia) **Quinolizidine alkaloids from *Ammopiptanthus mongolicus***. *Planta Medica*, v. 57(Supplement 2): p. A109, 1991 (6 ref, Eng).

Besides the already known alkaloids, homoor-mosanine and homopiptanthine were isolated from the stems as new alkaloids for the genus; 3alpha-hydroxy-alpha-isolupanine, isolated from the seeds, is a new alkaloid. Alkaloids of the lupanine-type are accumulated mainly in the seeds. In the aerial parts, however, the biosynthetic pathway reaches the lupanine as well as the ormosanine and homoor-mosanine types.

9205-3307 Senatore, F., De Feo, V., De Simone, F., Mscisz, A., Mrugasiewicz, K., Gorecki, P. (Dipartimento di Chimica delle Sostanze Naturali, Universita degli Studi Federico II, Via Domenico Montesano 49, 80131 Napoli, Italy) **Sterols from *Leonurus cardiaca* L. growing in different geographical areas**. *Herba Polonica*, v. 37(1): p. 3-7, 1991 (19 ref, Eng, Pol).

Sterol composition of *L.cardiaca* cultivated in Italy and in Poland was determined. Total sterol content is nearly the same in both samples examined and beta-sitosterol is always the main sterol. Some differences for other sterols were observed. This is probably due to different pedoclimatic conditions of growth.

9205-3308 Sexmero Cuadrado, M.J., Bruno, M., de la Torre, M.C., Piozzi, F., Savona, G., Rodriguez, B. (Instituto de Quimica Organica, CSIC, Juan de la Cierva 3, 28006 Madrid, Spain) **Rearranged abietane diterpenoids from**

the root of two *Teucrium* species. *Phytochemistry*, v. 31(5): p. 1697-1701, 1992 (10 ref, Eng).

From the root of *Teucrium fruticans*, two new rearranged abietane diterpenoids, teuvincenones F and G, have been isolated together with the known diterpene teuvincenone E. The acetone extract of the root of *T.polium* subsp. *expansum* yielded three previously known compounds (feruginol and teuvincenones A and B) and two new 17(15-16)-abeo-abietane derivatives (teuvincenones H and I).

9205-3309 Sha, Z.F., Sun, W.J., Gao, H., Miao, M.L. (Shaanxi Provincial Institute for Drug Control, Xian 710 061, China) **Determination of osthole and columbianetin acetate in *Angelica pubescens* by reversed phase HPLC**. *Acta Pharmaceutica Sinica*, v. 26(10): p. 798-800, 1991 (2 ref, Chi, Eng).

Osthole and columbianetin acetate have been isolated from the radix dry of *A.pubescens* using reversed phase HPLC. The compounds were identified by comparison of their melting points MS, UV and IR spectra with authentic samples. Both the coumarins were present in roots only. The stems and leaves of the plants were devoid of coumarins.

9205-3310 Shah, K.C., Baxi, A.J.*, Dave, K.K. (Department of Chemistry, Saurashtra University, Rajkot 360 005, Gujarat, India) **Isolation and identification of free sugars and free amino acids from *Butea frondosa* Roxb flowers**. *Indian Drugs*, v. 29(9): p. 422-423, 1992 (7 ref, Eng).

Glucose, fructose, histidine, aspartic acid, alanine and phenyl alanine have been isolated from the defatted flower petals and identified.

9205-3311 Sheridan, H., Bhandari, P. (Department of Pharmacology, Trinity College Dublin, 18, Shrewsbury Road, Dublin 4, Ireland) **Cathin-6-one from the root bark of *Phellodendron chinense***. *Planta Medica*, v. 52(3): p. 299, 1992 (7 ref, Eng).

An alkaloid cathin-6-one has been isolated from the petroleum ether extract of roots of *P.chinense* by column chromatography and preparative TLC.

9205-3312 Shin, S.H., Sim, Y., Kim, Y.S., Chi, H.J., Lee, E.B. (College of Pharmacy, Duksung Women's University, Seoul 132-714, Korea) **Studies on essential oils of *Lycopus lucidus* Turcz.**. *Korean Journal of Pharmacognosy*, v. 23(1): p. 29-33, 1992 (20 ref, Eng).

The essential oil obtained from dried *L.lucidus* by steam distillation followed by fractionation by column chromatography was analysed by gas chromatography-mass spectrometry (GC-MS). The compounds identified by GC-MS were carvacrol, 2,5-dimethoxy-p-cymene, trans-

caryophyllene, spathurenol and trans-beta-farnesene. Two compounds, thymol and caryophyllene were isolated by silica gel column chromatography and analyzed by TLC, IR, Mass and NMR. The weak diuretic effects of essential oil and water extract from the dried drugs were observed in rats.

9205-3313 Shiobara, Y., Inoue, S.S., Nishiguchi, Y., Kato, K., Takemoto, T., Nishimoto, N., De Oliveira, F., Akisue, G., Akisue, M.K., Hashimoto, G. (Faculty of Pharmaceutical Sciences, Tokushima Bunri University, Yamashiro-cho, Tokushima 770, Japan) **Pfaffane-type nortriterpenoids from *Pfaffia pulverulenta***. *Phytochemistry*, v. 31(5): p. 1737-1740, 1992 (8 ref, Eng).

Pulveric acid, 11-deoxopulveric acid, 11-oxopaffic acid and pfaffoside G, four new hexacyclic nortriterpenoids, have been isolated together with ecdysterone, rubrosterone and pfaffic acid from *P. pulverulenta*. The structures of the new compounds were elucidated as 3,11-dioxopaffan-12-ene-28-oic acid, 3-oxopaffan-12-ene-28-oic acid, 3beta-hydroxy-11-oxopaffan-12-ene-28-oic acid and 3beta-hydroxypaffan-12-ene-28-oic acid-(28-1)-beta-D-glucuronopyranosyl ester, respectively. ¹³C NMR signals were fully assigned using 2D NMR techniques.

9205-3314 Sibanda, S., Mebe, P.P., Multari, G. (Department of Chemistry, University of Zimbabwe, P O Box MP 167, Mount Pleasant, Harare, Zimbabwe) **Pentacyclic triterpenoids from *Euclea crispa***. *Fitoterapia*, v. 63(3): p. 274, 1992 (4 ref, Eng).

Oleanolic acid (1.4 percent), lupeol (3.9) and betulin (2.2) have been isolated from the root bark of *E. crispa*.

9205-3315 Singh, R.B. (Department of Organic Chemistry, Agra College, Agra 282002, UP, India) **Structure of degraded glucomannan from *Nyctanthes arbor-tristis* Linn. seeds**. *Polish Journal of Chemistry*, v. 65(5-6): p. 927-932, 1991 (23 ref, Eng).

The degraded glucomannan from *Nyctanthes arbor-tristis* seeds was isolated on the basis of hydrolysis, methylation and periodate oxidation experiments, a structure has been assigned to the degraded glucomannan and to the parent glucomannan.

9205-3316 Singh, R.S., Misra, T.N., Pandey, H.S., Singh, B.P. (Natural Products Research Laboratory, Department of Chemistry, University of Gorakhpur, Gorakhpur 270 009, UP, India) **New aliphatic alcohol from *Adhatoda vasica***. *Fitoterapia*, v. 63(3): p. 262-263, 1992 (4 ref, Eng).

From the petrol extract of aerial parts of *A. vasica*, a new aliphatic alcohol has been isolated and characterized as 29-methyltriacontan-1-ol on the basis of spectral data.

9205-3317 Singh, V., Singh, J., Sharma, J.P. (Natural Products Laboratory, Department of Chemistry, University of Allahabad, Allahabad 211 002, UP, India) **Anthraquinones from heartwood of *Cassia siamea***. *Phytochemistry*, v. 31(6): p. 2176-2177, 1992 (17 ref, Eng).

From heartwood of *C. siamea*, a new bianthraquinone, 4,4'-bis(1,3-dihydroxy-2-methyl-6,8-dimethoxyanthraquinone), along with 1,1'-bis(4,5-dihydroxy-2-methyl anthraquinone), chrysophanol and emodin have been isolated.

9205-3318 Sivakumar, R., Nair, A.G.R. (Department of Chemistry, Pondicherry University, Pondicherry-605014, India) **Polyphenols of *Zantedeschia aethiopica***. *Fitoterapia*, v. 63(2): p. 189, 1992 (4 ref, Eng).

Swertisin (5,4'-dihydroxy-7-methoxy-6-C-beta-D-glucopyranosylflavone) (110 mg), swertiajaponin (5,3',4'-trihydroxy-7-methoxy-6-C-beta-D-glucopyranosylflavone) (50 mg), cyanidin, peoniodin, and ferulic acid have been isolated from the flowers of *Z. aethiopica*.

9205-3319 Slavik, J., Slavikova, L. (Biochemical Institute of Medical Faculty, Masaryk University, 66243 Brno, Czechoslovakia) **Quaternary alkaloids from *Thalictrum minus***. *Collection of Czechoslovak Chemical Communications*, v. 57(3): p. 573-578, 1992 (19 ref, Eng).

Quaternary alkaloids berberine (chloride 0.18 percent), magnoflorine as iodide, 1.06 percent), jatrorrhizine (as iodide 0.066 percent), thalphenine (as iodide 0.040 percent) and thalifendine (as iodide 0.021 percent) were isolated after separation from the root of *T. minus* ssp *elatum* of Czechoslovak origin (1.8 percent alkaloid content). The aerial parts (0.013 percent alkaloids) quaternary fraction contain only negligible amounts of magnoflorine, berberine and copticine.

9205-3320 Smith, R.M., Oliveros-Belardo, L. (Department of Chemistry, Loughborough University of Technology, Loughborough, Leics, LE11 3TU, England) **Volatile compounds from the fruit peelings of *Diospyros discolor* Willd.** *Journal of Essential Oil Research*, v. 4(3): p. 287-289, 1992 (7 ref, Eng).

A petroleum ether extract of the peelings of the fresh fruits of *D. discolor* on treatment with ethanol gave an extract in which the following major components were identified: benzylbenzoate (19.2 percent), benzylsalicylate (26.9 percent), cinnamyl benzoate (10.3 percent), benzylbutyrate (4.1 percent) and butylbenzoate (6.0 percent).

9205-3321 Snook, M.E., Chortyk, O.T., Sisson, V.A., Costello, C.E. (USDA-ARS, Russell Research Center, PO Box 5677, Athens, GA 30613, USA) **Flower flavonols of**

Nicotiana species. *Phytochemistry*, v. 31(5): p. 1639-1647, 1992 (19 ref, Eng).

Flavonol glycoside distributions were determined for 63 of the 66 recognized species, two accessions of tentative species rank, and 14 interspecific crosses (allotetraploids). Only quercetin and kaempferol glycosides were found in any appreciable quantity. Quercetin and kaempferol 3-(2G-rhamnosylrutinoside), kaempferol, 3-rhamnosylgalactoside, kaempferol 3-rhamnosyl galactoside-7-glucoside, kaempferol 3-(2-glucosylgalactoside)-7-glucoside, and kaempferol 3-sophoroside-7-glucoside were identified in several species. The percentage distribution of these compounds and quercetin and kaempferol 3-rutinosides, 3-sophorosides, and 3-rutinoside-7-glucosides showed that the flavonols of the flowers varied much more than leaf flavonols. The data have allowed a chemotaxonomic evaluation of the genus classification.

9205-3322 Sordat-Diserens, I., Msonthi, J.D., Hostettmann, K. (Institut de Pharmacognosie et Phytochimie, Universite de Lausanne, BEP, CH-1015 Lausanne, Switzerland) **Antifungal xanthenes from *Polygala nyikensis*.** *Planta Medica*, v. 57(Supplement 2): p. A131-A132, 1991 (6 ref, Eng).

Structures of four xanthenes isolated from the roots of *P.nyikensis*, were elucidated by one and two dimensional NMR spectroscopic techniques, mass spectrometry and UV spectroscopy. Two xanthenes were found to be active against the plant pathogenic fungus *Cladosporium cucumerinum*.

9205-3323 Spring, O., Rodon, U., Macias, F.A. (Universitat Tubingen, Institut fur Biologie I, Auf der Morgenstelle 1, D-7400 Tubingen, Germany) **Sesquiterpenes from non-capitate glandular trichomes of *Helianthus annuus*.** *Phytochemistry*, v. 31(5): p. 1541-1544, 1992 (23 ref, Eng).

Leaf extracts of the common sunflower *H.annuus*, in addition to known sesquiterpene lactones, afforded three new sesquiterpenes, the structures of which were elucidated by spectroscopic analysis. The localization of the compounds in noncapitate glandular hairs was demonstrated by trichome microsampling in combination with HPLC analysis. All three compounds possess antimicrobial activity.

9205-3324 Stausberg, S., PaBreiter, C.M., Willuhn, G. (Institut fur Pharmazeutische Biologie, Heinrich-Heine-Universitat Dusseldorf, D-4000 Dusseldorf, Federal Republic of Germany) **Chromenes from rhizomes and roots of *Arnica chamissonis* ssp. *foliosa*.** *Planta Medica*, v. 57(Supplement 2): p. A89, 1991 (4 ref, Eng).

The chromenes 1-9 were isolated from the rhizomes and roots of *A.chamissonis* ssp. *foliosa*. Compounds 1,3,5 and 8 were identified on the basis of their mass and ¹H-NMR spectral data. The constituents 2,4,6 and 7 occurred only in traces and were not obtained in pure form. Their identity was confirmed by direct comparison (TLC, GC and GC-MS) with authentic samples. The structure of the minor constituent 9 followed from the GC-MS analysis. The mass spectrum showed the same fragmentation pattern as 8, with only the ester group changed.

9205-3325 Strzelecka, H., Wojtasik, E. (Zaklad Farmakognozji AM, ul. Banacha 1, 02-097 Warszawa, Polska) **Investigations on the anthranoid compounds: Chemical studies.** *Herba Polonica*, v. 36(4): p. 165-173, 1990 (25 ref, Eng, Pol).

Isolation and identification of new anthranoid compounds from herbal raw materials have been described. Sennoside E glycoside, aloins, homonataloin, aloesins, alaternine, rhamnoalpiggenin, 2-methoxystypandrone, tinnevelin and 6-hydroxymysisine were isolated from *Rumex pulcher*. New methods for the estimation of anthranoid compounds have been described.

9205-3326 Sugiyama, M., Kikuchi, M.* (Tohoku College of Pharmacy, 4-4-1 Komatsushima Aoba-ku, Sendai-shi 981, Japan) **Studies on the constituents of *Osmanthus* species. X. Structures of phenolic glucosides from the leaves of *Osmanthus asiaticus* Nakai.** *Chemical & Pharmaceutical Bulletin*, v. 40(2): p. 325-326, 1992 (4 ref, Eng).

Three new phenolic glucosides were isolated from the leaves of *O.asiaticus*. Their structures were determined to be 2-hydroxy-5(2-hydroxyethyl)phenyl beta-D-glucopyranoside, 4-(2,3-dihydroxypropyl)-2,6-dimethoxyphenyl beta-D-glucopyranoside and D-threo-guaiacylglycerol 7-O-beta-D-glucopyranoside, respectively, on the basis of chemical and spectral data.

9205-3327 Sung, T.V., Adam, G. (Institute of Natural Products Chemistry, Nghia do, Tu liem, Hanoi, Vietnam) **An acetylated bidesmosidic saponin from *Schefflera octophylla*.** *Journal of Natural Products*, v. 55(4): p. 503-505, 1992 (8 ref, Eng).

The structure of a new acetylated bidesmosidic triterpenoid saponin isolated from the leaves of *S.octophylla* have been elucidated as 3-epi-betulinic acid 3-O-beta-D-6'-acetylglucopyranoside 28-{alpha-L-rhamnopyranosyl(1-4)-O-beta-D-glucopyranosyl(1-6)}-beta-D-glucopyranoside.

9205-3328 Sung, T.V., Kutschabsky, L., Porzel, A., Steglich, W., Adam, G. (Institute of Natural Products

Chemistry, Nghia-Do, Tu Liem, Hanoi, Vietnam) **Sesquiterpenes from the roots of *Homalomena aromatica*.** *Phytochemistry*, v. 31(5): p. 1659-1661, 1992 (10 ref, Eng).

Two new sesquiterpene alcohols, homalomenol C and homalomenol D, besides (-)- α -cadinol and (-)-T-muurolol, have been isolated from the roots of *H. aromatica*. The structures of the new constituents were elucidated by spectroscopic methods, especially 2D NMR spectroscopy and X-ray analysis.

9205-3329 Suzuki, Y., Koike, K., Ohmoto, T.* (School of Pharmaceutical Sciences, Toho University, 2-2-1 Miyama, Funabashi, Chiba 274, Japan) **Eight picrotoxane terpenoids, picrodendrins K-R, from *Picrodendron baccatum*.** *Phytochemistry*, v. 31(6): p. 2059-2064, 1992 (4 ref, Eng).

Eight new picrotoxane-type terpenoids, picrodendrins K-R, were isolated from the stems of *P. baccatum* and identified by spectral analysis.

9205-3330 Takayamam, H., Katsura, M., Seki, N., Kitajima, M., Aimi, N., Sakai, S., Santiarworn, D., Liawruangrath, B. (Faculty of Pharmaceutical Sciences, Chiba University, 1-33, Yayoi-cho, Chiba 260, Japan) **Elaeocarpidine, a naturally occurring racemate, from *Tarenna vanprukii*.** *Planta Medica*, v. 58(3): p. 289-291, 1992 (11 ref, Eng).

From the methanol extracts of the leaves of *T. vanprukii*, one alkaloid as a crystalline powder elaeocarpidine (1) (m.p. 228 degree C) has been isolated. Its structure was confirmed by direct comparison with the synthetic specimen. The complete assignment of protons and carbons in I was made by measurement of the 2D 1H-1H and 1H-13C COSY spectra.

9205-3331 Tits, M., Angenot, L., Damas, J., Dierckxsens, Y., Poukens, P. (Institut de Pharmacie, Universite de Liege, rue Fusch, 5. B-4000 Liege, Belgium) **Anti-inflammatory prodelphinidins from black currant (*Ribes nigrum*) leaves.** *Planta Medica*, v. 57(Supplement 2): p. A134, 1991 (8 ref, Eng).

From the aqueous acetone extract of *R. nigrum* leaves, two prodelphinidin dimers viz., gallocatechin-(4 α -8)-epigallocatechin and gallocatechin-(4 α -8)-gallocatechin and a new trimeric prodelphinidin, gallocatechin-(4 α -8)-gallocatechin were isolated and identified. These three prodelphinidins showed a dose dependent antiinflammatory activity.

9205-3332 Tripathi, V.K., Pandey, V.B. (Department of Medicinal Chemistry, Institute of Medical Sciences,

Banaras Hindu University, Varanasi-221005, UP, India) **Stem alkaloids of *Fumaria indica*.** *Phytochemistry*, v. 31(6): p. 2188-2189, 1992 (Eng).

Narlumicine, a seco-phthalide isoquinoline alkaloid, has been isolated from the stems of *F. indica* together with protopine, protopine nitrate, DL-tetrahydrocoptisine and narlumidine. Its structure has been established by spectroscopic methods.

9205-3333 Tsitsa-Tzardi, E., Loukis, a., Philianos, S. (Laboratory of Pharmacognosy, University of Athens, 20 Hippocratous str, 106 79 Athens, Greece) **Constituents of *Sorbus torminalis* leaves.** *Fitoterapia*, v. 63(2): p. 189-190, 1992 (3 ref, Eng).

Ether extract of *S. torminalis* yielded p-coumaric acid and caffeic acid while chloroform extract yielded quercetin and methanol extract yielded caffeic acid, chlorogenic acid, luteolin-7-O-glycoside and apigenin-7-O-glycoside.

9205-3334 Tucker, A.O., Maciarello, M.J., Landrum, L.R. (Department of Agriculture and Natural Resources Delaware State College, Dover, DE 19901-2275) **Volatile leaf oils of caribbean myrtaceae. V. *Pimenta obscura* proctor of Jamaica.** *Journal of Essential Oil Research*, v. 4(2): p. 195-196, 1992 (Eng).

The foliar oils of *Pimenta obscura*, which were examined by GC/MS, were found to be rich in either 1,8-cineole (16.84-25.11 percent), limonene (5.31-11.48 percent) and p-cymene (10.97-11.33 percent) with lesser amounts of terpinen-4-ol (4.92-9.80 percent) and α -phellandrene (2.59-6.33 percent), or ledol (13.47 percent) and palustrol (7.64 percent).

9205-3335 Tzakou, O., Vyas, C., Philianos, S. (Laboratoire de Pharmacognosie, Panepistimioupolis, Couponia, Zografou 157-71, Athenes) **Polyphenol constituents of the aerial parts of *Galium heldreichii* Hal. 2. Communication.** *Plantes Medicinales et Phytotherapie*, nv. 25(2-3): p. 123-126, 1991 (7 ref, Eng, Fre).

Diosmetin-6-O-beta-glucoside, esculetin, quercetin-3-O-beta-galactoside have been isolated and identified from the ethylacetate fraction of a methanolic extract of the aerial parts of *G. heldreichii*. Chlorogenic acid, rutin and quercetin-3-O-beta-glucoside were isolated and identified from the butanol fraction of the same extract.

9205-3336 Ulubelen, A., Topcu, G. (Faculty of Pharmacy, University of Istanbul, Istanbul, Turkey) **New abietane diterpenoids from *Salvia montbretii*.** *Journal of Natural Products*, v. 55(4): p. 441-444, 1992 (10 ref, Eng).

Five known compounds, ferruginol, ferruginyl 12-methyl ether, taxodione, hypargenin F, and

demethylcryptojaponol, and three new abietane-type diterpenoids, montbretol - (6,12-dihydroxyabieta-5,8,11,13-tetraen-7-one), montbretyl 12-methyl ether (6-hydroxy-12-methoxyabieta-5,8,11,13-tetraen-7-one), and 14-hydroxy-ferruginol, were isolated from the roots of *Salvia montbretii*. Structures were established by IR, UV, MS, and NMR spectral data.

9205-3337 Umamo, K., Hagi, Y., Nakahara, K., Shoji, A., Shibamoto, T. (Takata Koryo Company, Ltd., No.22-2, 7-Chome, Tsukaguchi-Honmachi, Amagasaki, Hyogo 661, Japan) **Volatile constituents of green and ripened pineapple (*Ananas comosus* L. Merr.).** *Journal of Agricultural and Food Chemistry*, v. 40(4): p. 599-603, 1992 (13 ref, Eng).

Volatile constituents of green and ripened pineapples were isolated and identified by gas chromatography and gas chromatography/mass spectrometry. The numbers of volatiles found were 144 and 127 in green and ripened pineapples, respectively. Among a total of 157 constituents identified, 50 were identified for the first time from pineapple. Esters constituted over 80 percent of total volatiles from both green and ripened pineapples. The major volatile constituents in green pineapples were ethyl acetate and ethyl 3-(methylthio) propanoate. In ripened pineapples, ethyl acetate and butane-2,3-diol diacetate were the main constituents.

9205-3338 Uniyal, S.K., Badoni, V., Sati, O.P. (Department of Chemistry, H N B Garhwal University, Srinagar 246 174, UP, India) **A new triterpenoidal saponin from *Acacia auriculiformis*.** *Journal of Natural Products*, v. 55(4): p. 500-502, 1992 (13 ref, Eng).

A new triterpenoidal saponin has been isolated from an aqueous EtOH extract of the legumes of *Acacia auriculiformis* and characterized as 3-O-{beta-D-xylopyranosyl(1-3)-beta-D-xylopyranosyl(1-4)-alpha-L-rhamnopyranosyl(1-2)}-{alpha-L-rhamnopyranosyl(1-4)}-beta-D-glucopyranosyl-3,16,21-tri-hydroxyolean-12-en-28-oic acid by chemical studies and spectral data.

9205-3339 Vaishnava, M.M., Tripathy, A.K. (Chemistry Department, Government Model Science College, Bilaspur 495001, MP, India) **Flavonoids from *Syzygium cumini* roots.** *Fitoterapia*, v. 63(3): p. 259-260, 1992 (8 ref, Eng).

The roots of *S.cumini* contain myricetin-3-O-glucoside and the new flavonoid myricetin-3-O-robinoside.

9205-3340 Valenzuela, L., Vila, R., Canigueral, S., Adzet, T. (Unidad de Farmacologia y Farmacognosia, Facultad de Farmacia, Avda. Diagonal 643, E-08028, Barcelona,

Espana) **The essential oil of *Sphacele chamaedryoides*.** *Planta Medica*, v. 58(3): p. 273-274, 1992 (5 ref, Eng).

The first aerial parts of *S.chamaedryoides* gave by hydrodistillation an essential oil yield of 0.025 percent (v/w). The results of the qualitative and quantitative analysis by GC-FID and GC-MS are presented. The major constituents of the oil were alpha-phellandrene (13.0 percent), beta-caryophyllene (10.3 percent), T-cadinol (10.4 percent), spathulenol (6.4 percent), limonene (6.0 percent) and gamma-cadinene (5.9 percent).

9205-3341 Veen, G., Gresser, G., Krug, E., Gunther, S., Greinwald, R., Witte, L., Czygan, F.C. (Department of Pharmaceutical Biology, University of Wurzburg, D-8700 Wurzburg, Federal Republic of Germany) **Unusual new tricyclic quinolizidine alkaloids in fabaceae.** *Planta Medica*, v. 57(Supplement 2): p. A137, 1991 (1 ref, Eng).

Alkaloids, angustifoline N(12)-carboxymethyl ester and angustifoline N(12)-ethyl ester were isolated from *Lupinus polyphyllus*. Cytisine N(12)-carboxymethyl ester was isolated from *Petteria ramentacea*, while cytisine N(12)-carboxyethyl ester was isolated from *Ulex europaeus*, *Baptisia australis* and *Genista tinctoria*. Alkaloid, N(12)-O-propionyl cytisine was isolated from *P.ramentacea*, *spartium junceum*, *Laburnum watereri* var. *vossii* and *L.anagyroides*.

9205-3342 Vila, R., Vicario, G., Canigueral, S., Adzet, T. (Unitat de Farmacologia i Farmacognosia, Facultat de Farmacia, Universitat de Barcelona, Av. Diagonal 643, E-08028 Barcelona, Spain) **Constituent of the essential oil of *Thymus antoninae*.** *Planta Medica*, v. 57(Supplement 2): p. A90, 1991 (3 ref, Eng).

T.antoninae was collected at the flowering stage in Sierra de los Donceles (Sample A) and Volcan de Cancarix (Sample B) (Albacete, Spain in May 1987 and the essential oil was obtained by hydrodistillation. More than 90 percent of constituent (84 components) of the essential oils of the two samples A and B identified were; 19.8 percent and 23.9 percent monoterpene hydrocarbons, 61.5 percent and 61.2 percent oxygenated monoterpenes, 3 percent and 2 percent sesquiterpene hydrocarbons and 7.6 percent and 3.5 percent oxygenated sesquiterpenes, respectively. The results showed no significant differences between A and B. In both cases, the major components were 1,8-cineole (19.2 percent in sample A and 24.4 percent in sample B), camphur (15.6 percent and 14.9 percent) and borneol (7.2 percent and 7.0 percent).

9205-3343 Viollon, C., Simeray, J., Leger, D., Chaumont, J.P. (Laboratoire de Botanique et Cryptogamie, Faculte de Medecine et de Pharmacie, Place Saint Jacques, 25030

Besancon Cedex, France) **Study of the essential oil of *Piper cubeba* L. originating from Ceylan.** *Plantes Medicinales et Phytotherapie*, v. 25(2-3): p. 118-122, 1991 (7 ref, Eng, Fre).

A sample of essential oil of *P.cubeba* obtained from Ceylan was submitted to a gas chromatography analysis. It was chemically different from the sample from Indonesia examined by earlier. It is still too earlier for asserting the presence of a new chemotype.

9205-3344 Wada, K., Yamamoto, T., Bando, H., Kawahara, N. (Hokkaido Institute of Pharmaceutical Sciences, 7-1, Katsuraoka-cho, Otaru 047-02, Japan) **Four diterpenoid alkaloids from *Delphinium elatum*.** *Phytochemistry*, v. 31(6): p. 2135-2138, 1992 (9 ref, Eng).

Four new C19-diterpenoid alkaloids, pacifidine, pacifiline, pacifinine and pacidine, and five known alkaloids were isolated from *D.elatum* cv. Pacific Giant. The structures of these alkaloids were determined on the basis of their spectral data.

9205-3345 Wagner, H., Elbl, G. (Institute of Pharmaceutical Biology, University of Munich, Karlstr.29, D(W)-8000 Munchen 2, Federal Republic of Germany) **ACE-inhibitory procyanidins from *Lespedeza capitata*.** *Planta Medica*, v. 58(3): p. 297, 1992 (9 ref, Eng).

The ethyl acetate fraction of the ethanol extract obtained from the leaves of *L.capitata* was found to inhibit the activity of angiotensin converting enzyme (ACE). Further fractionation and purification of oligomeric procyanidins by column chromatography and preparative reversed-phase HPLC (RP-18) resulted in the isolation of the dimeric procyanidins B1 (2R,3R,4R)-(-)-epicatechin-(4-8)-(+)-catechin (2), B3, (2R,3S,4S)-(+)-catechin-(4-8)-(+)-catechin, and B6 (2R,3S,4S)-(+)-catechin-(4-6)-(+)-catechin and the trimeric procyanidin C2(4.8:4.8)-all-trans-tri-(+)-catechin. Structure elucidation of procyanidin peracetates was achieved by FAB-MS, ¹H-NMR and C.D. measurements.

9205-3346 Walkowiak, A., Taniocznik, B., Kowalewski, Z. (Katedra i Zaklad Farmakognozji AM im. K. Marcinkowskiego, ul. Sieroca 10, 61-771 Poznan, Polska) **Flavonoid compounds of *Solanum dulcamara* L..** *Herba Polonica*, v. 36(4): p. 133-137, 1990 (16 ref, Pol, Eng).

The group of flavonoids compounds has been obtained from flowers and leaves of *S.dulcamara*. The presence of the following compounds has been ascertained by means of column, paper and thin-layer chromatography: quercetin, kaempferol, quercetin 3-glucoside, kaempferol 3-glucoside, quercetin 3-rhamnoglucoside, and kaempferol 3-rhamnoglucoside. Compounds E and F were the main

constituents of the flavonoids fraction in flowers, while C and E dominated in the flavonoid fraction from leaves.

9205-3347 Watanabe, M., Kono, Y., Watanabe, M., Uzawa, J., Teraoka, T., Hosokawa, D., Suzuki, Y., Sakurai, A., Teraguchi, M. (Institute of Physical and Chemical Research, Wako shi, Saitama 351-01, Japan) **Structure of Oryzalic acid B and three related compounds, a group of novel antibacterial diterpenes isolated from leaves of a bacterial leaf blight-resistant cultivar of rice.** *Bioscience, Biotechnology and Biochemistry*, v. 56(1): p. 113-117, 1992 (6 ref, Eng).

Oryzalic acid B and its related compounds (A, B and C) were isolated from healthy flag leaves of a bacterial leaf blight-resistant cultivar of rice as a group of novel antibacterial compounds. Their structures were determined to be ent-kaurane or ent-kaurene analogues, i.e., oryzalic acid B, ent-15-hydroxy-2,3-secokauren-2,3-dioic acid, compound A, ent-15,16-epoxy-2,3-dihydroxy-kaurane, compound B, ent-2,3,15-trihydroxy-kaurene, and compound C, ent-15,16-epoxy-kauran-3-one.

9205-3348 Weckert, E., Hummer, K., Addae-Mensah, I., Achenbach, H.* (Institut für Pharmazie und Lebensmittelchemie, Universität Erlangen, Germany) **Absolute configuration of chiromodine.** *Phytochemistry*, v. 31(6): p. 2170-2172, 1992 (8 ref, Eng).

The absolute configuration of chiromodine, a recently reported novel clerodane diterpene from *Croton megalocarpus*, has now been established by X-ray crystallography of its monoacetyl derivative to be 1R,2R,5R,6R,7R,10R.

9205-3349 Wei, Z.X., Pan, J.P., Li, Y. (Shanghai Institute of Materia Medica, Academic Sinica, (200 031), People's Republic of China) **Artemisinin G: A sesquiterpene from *Artemisia annua*.** *Planta Medica*, v. 58(3): p. 310, 1992 (10 ref, Eng).

The isolation and the structure determination of a new sesquiterpene named artemisinin G from the dry leaves of *A.annua* has been described.

9205-3350 Weig, R., Kaloga, M., Eich, E. (Institut für Pharmazeutische Biologie, Freie Universität Berlin, D-1000 Berlin 33, Federal Republic of Germany) **Ipobscurine C: A macrocyclic novel serotonin alkaloid with neolignan substructure from the seeds of *Ipomoea obscura*.** *Planta Medica*, v. 57(Supplement 2): p. A135-A136, 1991 (3 ref, Eng).

From the seeds harvested from *Ipomoea obscura* which were cultivated in the greenhouse (originally collected in Java), a new alkaloid based on serotonin has been isolated by a separation procedure. The structure of this

compound, ipobscurine, was elucidated by IR, UV, El-mass, (-)FAB-mass, EIHR-mass, ¹H-NMR, H/H-COSY, ¹³C-NMR, and NOESY spectra.

9205-3351 Weyerstahl, P., Marschall-Weyerstahl, H., Manteuffel, E., Kaul, V.K. (Institut für Organische Chemie, Technische Universität Berlin Strasse des 17. Juni 135, D-1000 Berlin 12, Germany) **Constituents of the essential oil of *Strobilanthes callosus* Nees.** *Journal of Essential Oil Research*, v. 4(3): p. 281-285, 1992 (11 ref, Eng).

The essential oil from *S. callosus* was analysed by a combination of GC, GC/MS and NMR. An oil obtained from preflowering plants was found to possess compositional differences to an oil from post-flowering plants. The oil from post-flowering plants contained trans-sabinene hydrate (3 percent), cis-sabinene hydrate (9 percent), terpinen-4-ol (19 percent), alpha-terpineol (5 percent) and methyl chavicol (24 percent). The oil from pre-flowering plants contained trans-sabinene hydrate (5 percent), cis-sabinene hydrate (14 percent), terpinen-4-ol (23 percent), alpha-terpineol (5 percent), and methyl chavicol was not detected.

9205-3352 Willigmann, I., Sommer, H., Beuscher, N. (Schaper & Brummer, D-3320 Salzgitter, Federal Republic of Germany) **Occurrence of Omega-3 fatty acids in *Portulaca oleracea*.** *Planta Medica*, v. 57 (Supplement 2): p. A91, 1991 (2 ref, Eng).

Fine cut, dried purslane *P. oleracea* herbas were extracted with acetone. Because the omega-3-fatty acids usually occur in great parts as fat, they first have to be hydrolysed. The following esterification yielded the fatty acid methyl esters. A gas chromatographic analysis of the methyl ester revealed three main peaks, which were to the palmitic acid, linoleic acid, and linolenic acid with the help of reference compounds. A comparative GC-MS measurement with the above-mentioned reference compounds verified the results. The quantitative analysis has been made by means of the gas chromatography with nonanoic acid methyl ester as an internal standard. The results of these determinations are reported.

9205-3353 Woerdenbag, H.J., Pras, N., Bos, R., Visser, J.F., Hendriks, H., Malingre, T.M. (Department of Pharmacognosy, University Centre for Pharmacy, Ant. Deusinglaan 2, NL-9713 AW Groningen, The Netherlands) **Analysis of artemisinin and related sesquiterpenoids from *Artemisia annua* by combined gas chromatography-mass spectrometry.** *Planta Medica*, v. 57 (Supplement 2): p. A93, 1991 (3 ref, Eng).

A GC method, generally applicable on plant material, for the analysis of artemisinin(1) and its precursors artean-

nuic acid(2) and arteannuin B(3) in one run has been developed. The method was validated by GC-MS, applied on pure reference standards (as solid probes and in methanolic solution) and extracts of different plant parts. The leaves, buds, and small stems contained the highest levels of 1, 2, and 3. Maximal concentrations were found in the buds: 0.29 percent 1, 0.68 percent 2, and 0.26 percent 3, calculated on DW. The main stem only contained minor amounts. In the side roots, 2 and 3 were found in concentrations of 0.017 percent and 0.006 percent DW, respectively, while 1 was absent. The main root was devoid of the three sesquiterpenoids.

9205-3354 Wolfender, J.L., Hamburger, M., Msonthi, J.D., Hostettmann, K. (Institut de Pharmacognosie et Phytochimie, Université de Lausanne, BEP, CH-1015 Lausanne, Switzerland) **Xanthones from *Chironia krebssii*.** *Planta Medica*, v. 57 (Supplement 2): p. A134-135, 1991 (5 ref, Eng).

Aerial parts of *C. krebssii* afforded seventeen xanthones with five different oxygenation patterns, of which four xanthone glycosides have been isolated for the first time.

9205-3355 Wu, Y.D., Zhang, F.Q., Zhang, M., Yan, Q.S., Huang, B.S., Chen, Z.L. (Ningxia Medicinal College, Yinchuan 750004, Shanghai Institute of Materia Medica, Academia Sinica, Shanghai 200 031, China) **Isolation and identification of cynanester A from *Cynanchum chinense* R.Br..** *Acta Pharmaceutica Sinica*, v. 26(12): p. 918-922, 1991 (12 ref, Chi, Eng).

Cynanester A(I), a new triterpenoid ester was isolated, together with lupeol acetate, lignoceric acid and beta-sitosterol, from *Cynanchum chinense*. The mass spectrum suggested the presence of caproyl group and lupane skeleton with isopropenyl group in the molecule. Alkaline hydrolysis of I with 5 percent methanolic potassium hydroxide yielded lupeol Ia and n-caproic acid. The acid was esterified with MeOH-H₂SO₄ to afford methyl caproate, by GLC comparison with authentic sample. The acid was also identified by IR comparison. The structure of cynanester A was established as lupeol caproate.

9205-3356 Yadava, R.N., Jain, B. (Natural Products Laboratory, Department of Chemistry, Dr. H S Gour University, Sagar 470 003, MP, India) **An apigenin derivative from *Impatiens balsamina*.** *Fitoterapia*, v. 63(2): p. 188, 1992 (11 ref, Eng).

Apigenin-4'-O-beta-D-xylofuranosyl (1-4)-O-beta-D-glucopyranoside (0.086 percent), identified by spectral analysis, chemical and enzymatic degradation, permethyla-

tion and hydrolysis, was isolated from the seeds of *I. balsamina*.

9205-3357 Yin, M.L., Liu, J., Chen, Z.L., Long, K., Zeng, H.W. (Shanghai Institute of Materia Medica, Academia Sinica, 319 Yue-yang Road, Shanghai 200 031, People's Republic of China) **Some new PAF antagonistic neolignans from Piper betle**. *Planta Medica*, v. 57(Supplement 2): p. A66, 1991 (3 ref, Eng).

Piperbetol, methylpiperbetol, piperol A, piperol B, and a potent cytotoxic compound, crotepoxide were isolated from the vines of *P. betle*. The structures of these neolignans were established by spectroscopic methods (including high field ^1H -NMR, ^{13}C -NMR, NOE difference, and HR-mass techniques) and chemical correlations.

9205-3358 Yoshida, T., Itoh, H., Matsunaga, S., Tanaka, R., Okuda, T. (Faculty of Pharmaceutical Sciences, Okayama University, Matsubara, Osaka 580, Japan) **Tannins and related polyphenols of Euphorbiaceous plants. IX. Hydrolyzable tannins with 1C4 glucose core from Phyllanthus flexuosus Muell. Arg.**. *Chemical & Pharmaceutical Bulletin*, v. 40(1): p. 53-60, 1992 (17 ref, Eng).

Four new hydrolyzable tannins (phyllanthusiins A-D), a new polyphenol of related structure (phyllanthusiin E), and eight known polyphenols have been isolated from the leaves of *Phyllanthus flexuosus*. On the basis of the spectroscopic methods including ^1H - ^{13}C long-range two-dimensional nuclear magnetic resonance techniques, phyllanthusiins A, B and C, were characterized as oxidative metabolites of geraniin. Phyllanthusiin D was determined to be a condensate of geraniin with acetone, and phyllanthusiin E, was an oxidized congener of ellagic acid.

9205-3359 Yoshida, T., Haba, K., Nakata, ., Okano, Y., Shingu, T., Okuda, T. (Faculty of Pharmaceutical Sciences, Okayama University, Tsushima, Okayama 700, Japan) **Tannins and related polyphenols of Melastomataceous plants. III. Nobotanins G, H and I, dimeric hydrolyzable tannins from Heterocentron roseum**. *Chemical & Pharmaceutical Bulletin*, v. 40(1): p. 66-71, 1992 (10 ref, Eng).

Three new hydrolyzable tannin dimers, nobotanins G, H and I, have been isolated from the leaves of *H. roseum* and their structures were elucidated on the basis of chemical degradations and nuclear magnetic resonance spectral analyses. Nobotanin I is a novel dimer possessing a dep-sidone-forming valoneoyl group in the molecule. Five known tannins, casuarictin, strictinin, geraniin and nobotanins B and F were also isolated.

9205-3360 Yoshida, T., Namba, O., Lu, C.F., Yang, L.L., Yen, K.Y., Okuda, T. (Faculty of Pharmaceutical Sciences, Okayama University, Tsushima, Okayama 700, Japan) **Tannins of Euphorbiaceous plants. X. Antidesmin A, a new dimeric hydrolyzable tannin from Antidesma pentandrum var. barbatum**. *Chemical & Pharmaceutical Bulletin*, v. 40(2): p. 338-342, 1992 (12 ref, Eng).

A new hydrolyzable tannin, antidesmin A (C₈₂H₅₆O₅₃) was isolated along with carpinusin and geraniin from dried leaves of *A. pentandrum* var. *barbatum* and its dimeric structure, composed of davidiin and geraniin has been elucidated by spectral and chemical methods.

9205-3361 Zdero, C., Bohlmann, F., Niemeyer, H.M. (Institute for Organic Chemistry, Technical University of Berlin, D-1000 Berlin 12, Germany) **Furolabdanes and linear diterpenes from Gutierrezia resinosa**. *Phytochemistry*, v. 31(5): p. 1723-1726, 1992 (18 ref, Eng).

The aerial parts of *G. resinosa* gave 15 new diterpenes including 12 labdanes and three nerylgeraniol derivatives. The structures were elucidated by high field NMR spectroscopy.

9205-3362 Zdero, C., Bohlmann, F., King, R.M. (Institute for Organic Chemistry, Technical University of Berlin, D-1000 Berlin 12, Germany) **Clerodane and labdane derivatives from Olearia teretifolia**. *Phytochemistry*, v. 31(5): p. 1703-1711, 1992 (15 ref, Eng).

The aerial parts of *Olearia teretifolia* afforded, in addition to two known diterpenes, 39 new ones, 20 ent-clerodanes and 19-ent-labdanes. Furthermore, a new enediynediene and coniferyl acetate were present. The structures were elucidated by high field NMR techniques. Chemotaxonomic aspects are discussed briefly.

9205-3363 Zeng, L., Lou, Z.C., Zhang, R.Y. (School of Pharmaceutical Sciences, Beijing Medical University, Beijing 100 083, China) **Quality evaluation of Chinese licorice**. *Acta Pharmaceutica Sinica*, v. 26(10): p. 788-793, 1991 (7 ref, Chi, Eng).

The contents of 12 compounds, viz. glycyrrhizinic acid, uralsaponin a, uralsaponin B, liquiritin, isoliquiritin, liquiritigenin, isoliquiritigenin, glycycomarin, isoglycycomarin, licochalcone A, glycyrol and isoglycyrol, present in Chinese licorice, the roots and rhizomes of 8 *Glycyrrhiza* species collected from 15 districts in China, were determined by high performance liquid chromatographic method. The quality evaluation of Chinese licorice was discussed according to the results of the determinations.

9205-3364 Zhang, Y.W., Xue, Z. (China-Japan Friendship Institute of Clinical Medical Sciences, Beijing 100 029, China) **New triterpenoid glycosides from *Dipsacus asper* Wall.** *Acta Pharmaceutica Sinica*, v. 26(12): p. 911-917, 1991 (3 ref, Chi, Eng).

Structures of two new triterpenoid glycosides isolated from the ethanol extracts of roots of *Dipsacus asper* were deduced as 3-O-beta-D-glucopyranosyl(1-3)-alpha-L-rhamnopyranosyl (1-2)-alpha-L-arabinopyranosyl hederagenin 28-O-beta-D-glucopyranosyl(16)-beta-D-glucopyranosyl ester and 3-O-alpha-L-rhamnopyranosyl (1-3)-beta-D-glucopyranosyl (1-3)-alpha-L-rhamnopyranosyl(1-2)-alpha-L-arabinopyranosyl hederagenin 28-O-beta-glucopyranosyl(1-6)-beta-D-glucopyranosyl ester, based on spectral analysis and chemical evidences as well as results of 2D-HPTLC.

9205-3365 Zhou, W., Cheng, Y. (Shanghai Institute of Organic Chemistry, Chinese Academy of Sciences, Shanghai 200032, PRC) **The stereo-, regio-, and chemo-selective conversion of diterpenoids, kamebakaurin to oriaonin.** *Science in China*, v. 35B(2): p. 194-199, 1992 (8 ref, Eng).

For the first time stereo-, regio-, and chemo-selective conversion of oridonin from kamebakaurin, isolated from *Rabdosia excisa* has been reported. The overall yield in 7 steps was 9 percent.

9205-3366 Zou, Z.M., Cong, P.Z. (Institute of Medicinal Plant Development, Chinese Academy of Medical Sciences, Beijing 100 094, China) **Studies on the chemical constituents from roots of *Agastache rugosa*.** *Acta Pharmaceutica Sinica*, v. 26(12): p. 906-910, 1991 (14 ref, Chi, Eng).

Eleven compounds were isolated from roots of *Agastache rugosa* and eight of them were identified as maslinic acid, oleanolic acid, 3-O-acetyl oleanolic aldehyde, acacetin, tilianin, agastachoside, daucosterol and beta-sitosterol, alongwith a new diterpenoid whose structure has been proposed as 19(4-3)abeo-11, 14-dihydroxy-12-methoxy-abieta-8,11,13,15-tetraen-7 one based on spectral data, named dehydroagastol. The studies on other two compounds are in progress.

Chemotaxonomy

9205-3367 Bringmann, G., Pokorny, F., Stablein, M., Ake Assi, L. (Institute of Organic Chemistry, University of Wurzburg, Am Hubland, D-8700 Wurzburg, Federal Republic of Germany) **Ancistrobreveine C: A "Mixed" ancistrocladaceae/dioncophyllaceae-type naphthylisoquinoline alkaloid from *Ancistrocladus abbreviatus*.**

Planta Medica, v. 57(Supplement 2): p. A97-A98, 1991 (6 ref, Eng).

Ancistrobreveine, N-methyldioncophylline A, and other naphthylisoquinoline alkaloids were isolated from *A.abbreviatus* which is the first species of the mentioned families that produces both Ancistrocladaceae-type (i.e. with an oxygen function at C-6 and S-configuration at C-3) and Dioncophyllaceae-type alkaloids (i.e. no oxygen at C-6 and R-configuration at C-3). The stereostructure of ancistrobreveine was determined and the alkaloid was named ancistroprevine C. This alkaloid represents the first mixed hybrid type naphthylisoquinoline alkaloid. The results underline the chemotaxonomical position of *A.abbreviatus* as a possible link between the two families.

9205-3368 Bugge, G. (Institut für Pflanzenbau und Pflanzenzüchtung, Universität Göttingen, Von-Siebold-Strasse 8, D-3400 Göttingen, Germany) **Investigation on the content of azulene and the chromosome number of the taxa of the *Achillea millefolium*-complex.** *Angewandte Botanik*, v. 65(5/6): p. 331-339, 1991 (12 ref, Ger, Eng).

Genotypes in the taxa *A.millefolium* have been investigated to find out the taxa with high azulene content. An extensive material obtained from European botanical gardens and collected from their natural environment have been analyzed for their azulene content and chromosome number. Possibilities of breeding *Achillea* with a high azulene content have been discussed.

9205-3369 Martonfi, P. (University of P. J. Safarik, Faculty of Sciences, Department of Experimental Botany and Genetics Manesova 23, CS-04154 Kosice, Czechoslovakia) **Polymorphism of essential oil in *Thymus pulegioides* subsp. *chamaedrys* in Slovakia.** *Journal of Essential Oil Research*, v. 4(2): p. 173-179, 1992 (23 ref, Eng).

The essential oil variability was studied in 181 samples of *Thymus pulegioides* subsp. *chamaedrys*. The set studied proved to represent five different chemotypes: fenchone-type, linalool-type, citral/geraniol-type, thymol-type and carvacrol-type. The fact that each population is represented by plants of various chemotypes demonstrates another case of chemical polymorphism in the genus. While in North Europe merely thymol and carvacrol types were found to occur in *Thymus pulegioides*, much higher chemotypic diversity is met within samples from Central Europe. This may be a consequence of higher level of genetic diversity as well.

9205-3370 Mimica-Dukic, N., Gasic, O., Kite, G., Fellow, L., Jancic, R. (Institute of Chemistry, Faculty of Sciences, University of Novi Sad, 21000 Novi Sad, Yugoslavia) **A study of the essential oil of *Mentha longifolia* growing in**

Yugoslavia. *Planta Medica*, v. 57(Supplement 2): p. A83-A84, 1991 (3 ref, Eng).

Composition of essential oil of *M. longifolia* populations (A,B,C) growing wild was examined and great variability was noticed. On the basis of results obtained population A was classified into carvone-dihydrocarvone chemotypes, while B with high content of menthone-isomenthone and population with high menthofuran content could not be classified into any reported chemotypes.

9205-3371 Passsreiter, C.M., Willuhn, G., Roder, E. (Institut fur Pharmazeutische Biologie, Heinrich-Heine-Universitat Dusseldorf, D-4000 Dusseldorf, Federal Republic of Germany) **Occurrence of tussilagine and isotussilagine in the genus Arnica.** *Planta Medica*, v. 57(Supplement 2): p. A106-A107, 1991 (6 ref, Eng).

Traces of the untypical and non-toxic pyrrolizidine alkaloids tussilagine and isotussilagine have been detected in the flowerheads of *A. montana* (subgenus *Montana*), *A. chamissonis* ssp *foliosa*, *A. amplexicaulis* (both subgenus *Chamissonis*), and *A. sachalinensis* (subgenus *Andropurpurea*). Their identity was unambiguously confirmed by direct comparison (TLC, GC, GC/MS) with authentic samples. The occurrence of toxic pyrrolizidines could be ruled out by the analytical methods used for detection. Up to now these two pyrrolizidines were only found in the monotypic genus *Tussilago* (Senecioneae) and in the genus *Echinacea* (Heliantheae).

9205-3372 Rauwald, H.W., Beil, A., Prodohl C P, S. (Institut fur Pharmazeutische Biologie, Johann Wolfgang Goethe-Universitat Frankfurt, Georg Voigt Strasse 16, D-6000 Frankfurt/M.11, Federal Republic of Germany) **Occurrence, distribution, and taxonomic significance of some C-glucosylanthrones of the aloin type and C-glucosylchromones of the aloeresin-type in Aloe species.** *Planta Medica*, v. 57(Supplement 2): p. A129-A130, 1991 (6 ref, Eng).

Chemical relationships between and within the *Aloes* groupings have been discussed. 400 leaf exudates from 183 *Aloe* species were analysed by a comprehensive TLC screening, among these 34 species have not yet been phytochemically investigated. Since 10-C-glucosylanthrones of the aloin-type and C-glucosylchromones of the aloeresin-type are characteristic constituents of *Aloes*, the occurrence and distribution of the following thirteen individual compounds were investigated: aloins A and B, homonataloins A and B, 7-hydroxyaloins A and B, 5-hydroxyaloin A, aloinosides A and B, the aloeresins A, B and C, and in addition the 6-phenyl-2-pyrone derivative aloenin.

9205-3373 Rauwald, H.W., Kober, M., Dietrich, A. (Institut fur Pharmazeutische Biologie, Johann Wolfgang Goethe-Universitat, Georg-Voigt-Str.16, D-6000 Frankfurt/M. 11, Federal Republic of Germany) **Are galanthamine and lycorine chemotaxonomical markers in the genus Gethyllis?.** *Planta Medica*, v. 57(Supplement 2): p. A107-A108, 1991 (6 ref, Eng).

Galathamine and lycorine content of thirteen *Gethyllis* species, endemic in South Africa, has been determined by HPLC and TLC. An orientating TLC screening showed a positive proof of alkaloids for only six species (*G. barkerae*, *G. grandiflora*, *G. lanuginosa*, *G. namquensis*, *G. oliverorum* and *G. uteana*), but an unambiguous lack of saponins in all samples tested. Lycorine was found in each alkaloid fraction whereas no galanthamine was detected in any of the *Gethyllis* extract. Lycorine may be regarded as a chemotoxonomical marker.

9205-3374 Sanz, M.J., Terencio, M.C., Manez, S., Peris, J.B., Rios, J.L. (Departamento de Farmacologia, Facultad de Farmacia, Universidad de Valencia, Valencia, Spain) **Phenolic compounds from two Xanthium species.** *Planta Medica*, v. 57(Supplement 2): p. A131, 1991 (5 ref, Eng).

Air dried powdered aerial parts of *X. italicum* on solvent extraction, followed by chromatography has resulted in the isolation of axillarin (quercetagenin 3,6-dimethyl ether), isoquercitroside (quercetin 3-O-glucoside), hyperoside (quercetin 3-O-galactoside) and an isochlorogenic acid. Other compounds, identified include glucose, galactose, chlorogenic and caffeic acids. Topical antiinflammatory tests of flavonoids showed significant activity with an inhibition of edema.

9205-3375 Sethi, K.L., Kazim, M., Kidwai, M.A., Mital, S.P. (National Bureau of Plant Genetic Resources, New Delhi 110012, India) **Variation of chemo-botanical characters in the indigenous collections of Rauvolfia serpentina.** *Indian Journal of Genetics & Plant Breeding*, v. 51(1): p. 134-138, 1991 (8 ref, Eng).

The highest range of variation for total root weigh/plant and number of secondary roots/plant was observed in the collections *R. serpentina* from Coondapur and Conacana regions of Karnataka and Goa, respectively. These two characters contribute of high alkaloid recovery. The Coondapur region gave the highest range (1.58-2.03) of total alkaloids with a mean of 1.81. The same pattern was observed for reserpine content with the range of 0.07-0.24 and mean value of 0.16 percent. Such chemo-botanical variation in these materials is natural due to their geographic, ecological and topographic variation.

9205-3376 Uehara, S.I., Yasuda, I., Takeya, K., Itokawa, H. (The Tokyo Metropolitan Research Laboratory of Public Health, 3-24-1, Hyakunincho, Shinjuku-ku, Tokyo 169, Japan) **Comparison of the commercial turmeric and its cultivated plant by their constituents.** *Shoyakugaku Zasshi*, v. 46(1): p. 55-61, 1992 (23 ref, Eng, Jap).

Eight sesquiterpenoids, alpha-curcumen (1), zingiberene (2), beta-bisabolene (3), beta-sesquiphellandene (4), ar-(+)-turmerone (5), alpha-turmerone (6), beta-turmerone (7) and germacrone (8) were identified from the hexane extract of turmeric. Germacrone was detected in turmeric for the first time. The Rhizomes of four species of *C. longa* could be classified into two chemotypes by their sesquiterpenoid compositions. The first type contained large amounts of 2, 4 and 6, and 8 as the key compound (Ia type). The second type contained a large amount of 6, small amounts of 1-4 and none of 8 (IIa type). The fourteen commercial turmeric, collected in China, Japan and Taiwan, revealed somewhat different GC patterns: they generally contained larger amounts of 1 and 5 and smaller amounts of 2 and 6. They could also be divided into two chemotypes analogously (Ib and IIb type). The total curcuminoid contents of IIa and IIb types were higher than those of Ia and Ib types.

9205-3377 Weyerstahl, P., Marschall-Weyerstahl, H., Schroder, M., Kaul, V.K. (Institut für Organische Chemie, Technische Universität Berlin, Strasse des 17. Juni 135, D-1000 Berlin 12, Germany) **The monoterpene region of the essential oil of *Artemisia laciniata*.** *Journal of Essential Oil Research*, v. 4(2): p. 107-112, 1992 (8 ref, Eng).

The essential oil from *A. laciniata* (worm wood) from the Kashmir region of India (two different locations and two different times of harvesting) was analyzed and found to contain mainly functionalized monoterpenes. Two chemotypes can be distinguished, the cis-chrysanthenyl acetate (20 percent) artemisia ketone (12 percent)-type and the piperitone (20 percent)-type.

Ethnomedicine

9205-3378 Bhattarai, N.K. (Deputy Scientific Officer, National Herbarium and Plant Laboratories, Department of Forestry and Plant Research, G P O Box 938, Kathmandu, Nepal) **Folk herbal remedies of Sindhupalchok district, central Nepal.** *Fitoterapia*, v. 63(2): p. 145-155, 1992 (3 ref, Eng).

Information on 63 plant species with 85 prescriptions for therapeutic doses, along with medicinal applications of each species are presented. As the traditional herbal remedies are based on ancestral knowledge and empiric experiences, these appeared to be very much alive and

functioning in the study area. The traditional pharmaceutical practice shows trends towards modernization in many aspects. A critical phytochemical and pharmacological evaluation of the available prescriptions has been suggested.

9205-3379 Gopakumar, K., Vijayalakshmi, B., Shantha, T.R., Yoganarasimhan, S.N. (Regional Research Centre (Ay.), Ashoka Pillar, Jayanagar, Bangalore 560 011, Karnataka, India) **Plants used in Ayurveda from Chikmagalur district, Karnataka-II.** *Journal of Economic and Taxonomic Botany*, v. 15(2): p. 379-389, 1991 (1 ref, Eng).

Botany, chemical constituents, Ayurvedic preparations, therapeutic properties and major diseases on 51 plants/drugs collected from Chikmagalur district, Karnataka are presented.

9205-3380 Manandhar, N.P. (National Herbarium and Plant Laboratories, Godawari, Lalitpur, Nepal) **Folklore medicine of Dhading district, Nepal.** *Fitoterapia*, v. 63(2): p. 163-177, 1992 (36 ref, Eng).

The ethnobotanical information on 136 plant species, recorded from different places of the study area, along with local names and uses are presented in this paper. From the analysis of literature survey, the uses of 66 plant species seem to be recorded for the first time from this district.

9205-3381 Martinez, M.R., Póchettino, M.L. (Catedra Et-nografia I, Facultad de Ciencias Naturales y Museo, Universidad Nacional de La Plata, Paseo del Bosque s/n, 1900 La Plata, Republica Argentina) **The "farmacia casera" (household pharmacy): a source of ethanopharmacobotanical information.** *Fitoterapia*, v. 63(3): p. 209-216, 1992 (15 ref, Eng).

Study of the "farmacia casera" (household pharmacies) is a method of identifying the therapeutic elements used by the "medicos campesinos" (traditional healers) and inhabitants of Molinos (Salta, Rca, Argentina). Thirty two plant species belonging to 16 families are tabulated along with their use, modes of preparation and geographic origin.

9205-3382 Nyazema, N.Z., Mavi, S. (Department of Clinical Pharmacology, Medical School and National Herbarium, Zimbabwe) **Use of medicinal plants (phytotherapy): Medical and socio-politico-economic consequences.** *Zimbabwe Science News*, v. 25(1-3): p. 14-16, 1991 (7 ref, Eng).

Status of phytotherapy, uses of natural remedies, medical consequences of pharmacodynamics and pharmacokinetics of herbal drugs, socio-political-economic consequences, and future of herbal drugs have been briefly discussed.

9205-3383 Rao, R.R., Haridasan, K. (National Botanical Research Institute, Lucknow 226 001, UP, India) **An ethnobotanical survey of medicinal and other useful plants from North-East India.** *Journal of Economic and Taxonomic Botany*, v. 15(2): p. 423-436, 1991. (13 ref, Eng).

Local and botanical names, family and uses of 107 plants, including 81 medicinal plants of some parts of Meghalaya, Nagaland and Manipur have been discussed.

9205-3384 Siddiqui, M.B., Husain, W. (Department of Botany, Aligarh Muslim University, Aligarh 202 002, UP, India) **Some aquatic and marshy land medicinal plants from Hardoi district of Uttar Pradesh.** *Fitoterapia*, v. 63(3): p. 245-248, 1992 (10 ref, Eng).

Twenty four plant species belonging to seventeen families were recorded during an ethnobotanical survey of Hardoi district of Uttar Pradesh. The information on botanical names, local names, family and locality is included. Methods of preparing the drugs and doses are also given.

9205-3385 Singh, V.K., Ali, Z.A. (Survey of Medicinal Plants Unit, Department of Botany, Aligarh Muslim University, Aligarh 202 002, UP, India) **A contribution to the ethnopharmacological study of the Udaipur forests of Rajasthan, India.** *Fitoterapia*, v. 63(2): p. 136-144, 1992 (16 ref, Eng).

In an ethnopharmacological survey conducted in the Udaipur forests region of Rajasthan, some 33 plant species belonging to 25 families, were found to be commonly used in the area by local medicine men as folk drugs. Thirty-six recipes along with their mode of application and dosage are described. Many uses have not been hitherto described. The need to use such time-tested herbal drugs in the Indian Primary health Care programmes is re-stressed.

Analytical & Processing Techniques

9205-3386 Akihisa, T., Yamamoto, K., Tamura, T., Kimura, Y., Iida, T., Nambara, T., Chang, F.C. (College of Science and Technology, Nihon University, 1-8 Kanda Surugadai, Chiyoda-ku, Tokyo 101, Japan) **Triterpenoid ketones from *Lingnanium chungii* McClure: Arborinone, friedelin and glutinone.** *Chemical & Pharmaceutical Bulletin*, v. 40(3): p. 789-791, 1992 (22 ref, Eng).

The powder coating of a bamboo, (*L. chungii*) = *Bambusa chungii* was found to be a rich source of the 3-oxo pentacyclic triterpenes (25 percent on the recovery basis by chromatography on silica gel) which contained friedelin, arborinone and glutinone as the major components accompanied by minor amounts of alpha- and beta-amyrinones. A simple procedure for isolation of friedelin is described.

All proton and carbon-13 nuclear magnetic resonance signals for arborinone, friedelin and glutinone were assigned.

9205-3387 Asif M, Shafiullah (Department of Ilmu Advia, Ajmal Khan Tibbia College, Aligarh 202 002, UP, India) **Infrared spectra of some single herbal drugs (Mufradat): A spectroscopic approach in the standardization of drugs.** *Hamdard Medicus*, v. 35(1): p. 116-118, 1992 (6 ref, Eng).

Standardization of nine single unani herbal drugs viz., *Althaea officinalis*, *Anacyclus pyrethrum*, *Caesalpinia bonducella*, *Cannabis sativum*, *Chenopodium album*, *Coriandrum sativum*, *Curcumazedoaria*, *Pinus succinefera* and *Terminalia chelbula* of infrared spectrum has been reported.

9205-3388 Bader, G., Grimm, A., Hiller, K. (Fachbereich Pharmazie, Humboldt-Universität zu Berlin, 0-1120 Berlin, Federal Republic of Germany) **Quantitative determination of triterpenoid saponins in *Solidago virgaurea*.** *Planta Medica*, v. 57(Supplement 2): p. A67-A68, 1991 (5 ref, Eng).

After the alkaline hydrolysis of the mixture of genuine saponins, the monodesmosides A and B were identified by FAB-MS and by comparing with the prosapogenins of the known bisdesmosides *virgaurea* saponins. For the quantitative determination of saponins, the aerial parts of *S. virgaurea* were extracted and chromatographed. The recovery rate of triterpenoid saponins for the whole method including preparative TLC was 53.7 percent. The saponin content related to their prosapogenins was 0.21-0.32 percent.

9205-3389 Baser, K.H.C. (Anadolu University, 26470, Eskişehir, Turkey) **Turkish rose oil.** *Perfumer & Flavorist*, v. 17(3): p. 45-52, 1992 (13 ref, Eng).

There are two types of Turkish rose (*Rosa damascena*) oils available namely village- and factory-type. Both have distinctive characteristics. But the commercially recognized Turkish rose oil is the factory produced oil. Production techniques have been standardized and extrinsic factors responsible for variations in chemical composition of the oil have been described. Odour quality of rose oils can be predicted by the examination of gas chromatograms. Blending of different varieties of rose oils have been discussed.

9205-3390 Belakova, M., Havranek, E.*, Bujna, J. (Katedra Analytickej Chemie Farmaceutickej Fakulty UK, Odbojarov 10, 832 32 Bratislava, Czechoslovakia) **Determination of selected elements in Official plant samples packed in tea bags.** *Ceskoslovenska Farmacie*, v. 40(8-10): p. 226-229, 1991 (10 ref, Cze, Eng).

Identification and determination of eight selected elements (Fe, Ni, Cu, Zn, Pb, Br, Rb and Sr) in 10 plant species packed in the form of tea-bags has been described. The method used was X-ray fluorescence analysis with a radionuclide source (^{109}Cd) Cadmium (energy of 22.2 keV (Ag Ka), and with a Si/Li semiconductor detector connected to a multichannel analyzer Canberra 8100.

9205-3391 Blank, I., Grosch, W. (Deutsche Forschungsanstalt fuer Lebensmittelchemie, Lichtenbergstrasse 4, D 8046, Garching, West Germany) **Evaluation of potent odorants in dill herb (*Anethum graveolens* L.) by aroma extract dilution analysis.** *Journal of Food Science*, v. 56(1): p. 63-67, 1991 (38 ref, Eng).

Volatile components of dill seed and herb were analysed by gas chromatography-olfactometry which revealed the odorants having highest odoractivity value (ratio concentration to odor threshold). (+)-(4S)-Carvone was predominant of odorant dill seed. (+)-(3R,4S,8S)-3,9-epoxy-1-p-menthene, methyl-2-methylbutanoate, (+)-(4S)-alpha-phellandrene and myristicin were the most important odorant of dill herb.

9205-3392 Calts, I., Zor, M., Wright, A.D., Sticher, O. (Hacettepe University, Faculty of Pharmacy, Department of Pharmacognosy, TR 06100 Ankara, Turkey) **Triterpene saponins from *Scrophularia ilwensis*.** *Planta Medica*, v. 57(Supplement 2): p. A68-A69, 1991 (3 ref, Eng).

The water-soluble part of the methanol extract of the aerial parts of *S. ilwensis* was chromatographed over a polyamide column eluting first with water and then with an increasing percentage of MeOH. Fractions containing saponins were further subjected to medium pressure liquid chromatography, using reversed-phase material and 60-80 percent MeOH in water as eluent. Thus we obtained three triterpene saponins named ilwensisaponins A, B and C. The structures of the saponins were established by chemical (acid hydrolysis and acetylation) and spectroscopic methods (UV, IR, FAB-mass, $^1\text{H-NMR}$, $^{13}\text{C-NMR}$, 2D-homo- and hetero-COSY).

9205-3393 Gorecki, P., Drozdzyńska, M., Segiet Kujawa, E. (Institute of Medicinal Plants, P-61-707 Poznan, Poland) **Isolation and determination of flavonoids and chalcones in *Glycyrrhiza glabra* roots.** *Planta Medica*, v. 57(Supplement 2): p. A118, 1991 (5 ref, Eng).

Isolation of licuraside, liquiritigenin and isoliquiritigenin by a method involving acid hydrolysis is reported. These compounds were first separated by rotary thin layer chromatography, and then were applied as standards in quantitative analyses. Quantitative determination of isoliquiritigenin and liquiritigenin was performed by

spectrophotometric, colorimetric, and densitometric methods and by HPLC. Comparison of these methods showed that the most reliable results were achieved by the HPLC method. Spectrophotometric and densitometric methods were useful for routine analyses.

9205-3394 Grujic-Vasic, J., Bosnic, T. (Academy of Science and Arts, Bosnia and Herzegovina, 6-Novembra 7, 71000 Sarajevo, Yugoslavia) **A study of tannin drugs by means of the TAS technique.** *Planta Medica*, v. 57(Supplement 2): p. A118-A119, 1991 (4 ref, Eng).

Leaves of *Fragaria vesca* and *Juglans regia* were found to contain pyrogalllic tannins and after thermolyses phlorogucinol was not identified. In *Corylus avellana* and *Parnassia palustris* phloroglucinol was found among the products of TAS analysis. Method of TAS analysis has been recommended for the identification of tannins.

9205-3395 Hasler, A., Meier, B., Sticher, O. (Department of Pharmacy, Swiss Federal Institute of Technology (ETH) Zurich, CH-8092 Zurich, Switzerland) **Qualitative HPLC analysis of flavonoids of *Ginkgo biloba*.** *Planta Medica*, v. 57(Supplement 2): p. A120-A121, 1991 (6 ref, Eng).

An elaborated HPLC assay to detect the flavonoids from the leaves of *G. biloba* and from its therapeutically used extracts is reported. The method allows for the first time the separation of 33 flavonoids of *G. biloba* with their identification in one run. With this qualitative HPLC analysis it was possible to identify unambiguously twenty-two flavonoid glycosides, six flavonoid aglycones, and five biflavones.

9205-3396 Heuer, S., Wray, V., Metzger, J.W., Strack, D. (Institut für Pharmazeutische Biologie der TU Braunschweig, Mendelssohnstr.1, D-3300 Braunschweig, FRG) **Modern Spectroscopic methods in the structural elucidation of betacyanins from *Gomphrena globosa*.** *Planta Medica*, v. 57(Supplement 2): p. A121-122, 1991 (3 ref, Eng).

The red-violet betacyanin gomphrenin I and its acyl derivatives gomphrenin II and III were isolated from inflorescences of *Gomphrena globosa* and their structures elucidated by spectroscopic methods ($^1\text{H-NMR}$, ion-spray mass. The common aglycone is betanidin. The attachment of the glucose moiety to the O-6 of betanidin is typical for gomphrenins and is shown by $^1\text{H-NMR}$ spectroscopy.

9205-3397 Iwagami, S., Sawabe, Y., Nakagawa, T. (Faculty of Pharmaceutical Sciences, Kyoto University, Yoshidashimoadachi-cho, Sakyo-ku, Kyoto 606, Japan) **Micellar electrokinetic chromatography for the analysis of crude drugs (II). Simultaneous determination of glycyrrhizin and paeoniflorin in oriental pharmaceuti-**

cal preparations. *Shoyakugaku Zasshi*, v. 46(1): p. 49-54, 1992 (9 ref, Eng, Jap).

A method for the simultaneous analysis of glycyrrhizin (Gly) and paeoniflorin (Pae) in commercially available Chinese drug preparations was established in which micellar electrokinetic chromatography (MEKC) was used with a borate-phosphate running buffer solution (pH 9.0) containing a mixture of sodium dodecyl sulfate (SDS) and sodium cholate (CA) as anionic carriers. High DC voltage (ca. 215 V/cm) was applied. A sample was introduced into a 700 mmx0.05 mm I.D. fused silica capillary column by siphoning, and the on-column UV detection (250 nm) was performed by using n-butyl p-hydroxybenzoate as an internal standard. In Kamishoyosan and in several other Chinese drug preparations, the Gly and Pae peaks were separated from co-existing component peaks and their contents were determined within 20-25 min.

9205-3398 Jean, F.I., Collin, G.J.*, Lord, D. (Laboratoire d'analyse et de separation des essences vegetales, Universite du Quebec a Chicoutimi, Chicoutimi, Quebec G7H 2B1, Canada) **Essential oils and microwave extracts of cultivated plants.** *Perfumer & Flavorist*, v. 17(3): p. 33-41, 1992 (20 ref, Eng).

The technique of preparing natural product extracts of *Lavandula angustifolia*, *Coriandrum sativum*, *Anethum graveolens*, *Carum carvi*, *Foeniculum vulgare*, *Petroselinum crispum*, *Artemisia dracuncululus*, *Hyssopus officinale*, *origanum majorana*, *O. vulgare*, *Satureja hortensis*, *Salvia officinalis* and *Thymus vulgaris* has been described and compared with hydrodistillation of essential oils. Chemical compositions of extracts are simpler than those of essential oils. Concentration of sesquiterpenes generally is much greater in the essential oil than in the microwave extracts.

9205-3399 Kanaoka, M., Kato, H., Shimada, F., Yano, S. (Department of Natural Products Chemistry, Research Institute for Wakan-Yaku (Oriental Medicines), the First Department of Internal Medicine, Faculty of Medicine, Toyama Medical and Pharmaceutical University, 2630 Sugitani, Toyama 930-01, Japan) **Studies on the enzyme immunoassay of bio-active constituents in oriental medicinal drugs. VI. Enzyme immunoassay of ginsenoside Rb1 from Panax ginseng.** *Chemical & Pharmaceutical Bulletin*, v. 40(2): p. 314-317, 1992 (8 ref, Eng).

In order to determine the concentration of ginsenoside Rb1 (G Rb1) in sera of patients given red ginseng *P. ginseng*, an enzyme immunoassay of G Rb1 has been developed. The preparation of hapten, the specificity of anti-G Rb1 anti serum and the EIA of GRb1 have been reported.

9205-3400 Krawczyk, U., Petri, G., Kery, A. (Institute for Drug Research and Control, Chelmska 30/34, 00-725 Warsaw, Poland) **RP-HPLC separation of Vaccinium myrtillus anthocyanins.** *Planta Medica*, v. 57(Supplement 2): p. A123-A124, 1991 (6 ref, Eng).

A new method developed for the qualitative and quantitative estimation of *V. myrtillus* anthocyanins has been described. The method produced longer retention times of anthocyanins but enabled parallel detection of the co-occurring compounds. The method has been recommended for the standardization of pharmaceutical preparations containing bilberry anthocyanins.

9205-3401 Li, Y.H., Li, X.L. (School of Pharmacy, Second Military Medical University, Shanghai 200 433, China) **Determination of ergosterol in Cordyceps sinensis and cordyceps black-bone chicken capsules by HPLC.** *Acta Pharmaceutica Sinica*, v. 26(10): p. 768-771, 1991 (7 ref, Chi, Eng).

A high performance liquid chromatographic method was developed for the determination of ergosterol in *C. sinensis* and *Cordyceps* black-bone chicken capsules. The sample was mixed with 0.5 ml of saturated KOH solution and 5 ml of ethanol, and refluxed for 1 h. The saponified mixture was diluted with 5 ml of 10 percent NaCl solution and extracted 3 times with 5 ml portions of cyclohexane. The cyclohexane extracts were purified by partition column and concentrated by adsorption column and then analysed by HPLC. The other components of the *Cordyceps* black-bone chicken capsules have no interference to the determination of ergosterol. The proposed method is rapid, precise, accurate and sensitive. The whole process can be done in 2 hours.

9205-3402 Li, Y.H., Li, X.L., Hong, L., Liu, J.Y., Zhang, M.Y. (School of Pharmacy, Second Military Medical University, Shanghai 200 433, China) **Determination of panaxadiol and panaxatriol in radix Notoginseng and Yunnan baiyao by capillary supercritical fluid chromatography.** *Acta Pharmaceutica Sinica*, v. 26(10): p. 764-767, 1991 (5 ref, Chi, Eng).

Capillary supercritical fluid chromatography (SFC) was developed for the determination of panaxadiol and panaxatriol in Radix notoginseng and Yunnan Baiyao. 0.1 g Radix notoginseng powder or 0.5 g Yunnan Baiyao was mixed with 10 ml 15 percent H₂SO₄ ethanol-water (1:1) solution, adding 1 mg cholesterol as internal standard. The mixture was refluxed for 4 h, then adding 15 ml 15 percent NaOH solution, refluxed for 0.5 h. The mixture was extracted 3 times with 10 ml portions of cyclohexane. The cyclohexane extracts were purified by partition column and

concentrated by adsorption column and then analysed by SFC.

9205-3403 Maier, R., Kreis, W., Carle, R., Reinhard, E. (Lehrstuhl für Pharmazeutische Biologie der Universität Tübingen, Auf der Morgenstelle 8, D-7400 Tübingen, Federal Republic of Germany) **Partial purification and substrate specificity of a beta-glucosidase from *Chamomilla recutita*.** *Planta Medica*, v. 57(Supplement 2): p. A84-A85, 1991 (6 ref, Eng).

Freeze-dried ligulate florets of *C. recutita* were used as the starting material for the purification and further characterisation of the flavone-glucoside-cleaving beta-glucosidase (FCG). Fractionated ammonium sulfate precipitation and subsequent fast protein liquid chromatography on a Superose 12 column resulted in about a 15-fold enrichment of the FCG. Its Mr was determined to be approx. 500 kDa. During all of the purification step carried out non-specific beta-glucosidase activity, as determined with p-nitrophenyl-beta-D-glucoside as the substrate, parallels FCG activity. The FCG showed a broad acceptance of phenolic beta-monoglucosides. The cleavage of flavonoid glucosides by the FCG depends to a significant degree on the position of the sugar linkage within the skeleton, while 7-O-glucosides were preferred by the enzyme and 3-O-glucosides were not cleaved under standard conditions.

9205-3404 Meier, B. (Zeller A G, Pflanzliche Heilmittel-CH-8590 Romanshorn, Switzerland) **The extraction strength of ethanol/water mixtures commonly used for the processing of herbal drugs.** *Planta Medica*, v. 57(Supplement 2): p. A26-A27, 1991 (3 ref, Eng).

The extraction strength of several ethanol/water mixtures from 25 to 94 percent of ethanol in steps of approximately 10 percent was tested for the saponins in leaves of *Hedera helix* for hypericin and analogues, as well as for quercetin in the herb of *Hypericum perforatum* and for flavonoid glycosides in *Ginkgo biloba*. The highest yields in extractive materials correlated with the highest yields in interesting secondary metabolites in all three experiments. 50-60 percent Ethanol showed the highest extraction strength for all tested compounds. On the other hand, water extracted about 50 percent of total flavonoid glycosides of *Ginkgo biloba*, whereas no saponins of ivy leaves have been detected in an extract of 25 percent ethanol.

9205-3405 Mikage, M., Takeda, A., Tsuda, Y. (Faculty of Pharmaceutical Sciences, Kanazawa University, 13-1 Takaramachi, Kanazawa 920, Japan) **Evaluation of the crude drugs by means of colorimeter. I. Studies on the measuring condition and evaluation of powdered gin-**

seng and its allies. *Shoyakugaku Zasshi*, v. 46(1): p. 1-8, 1992 (8 ref, Eng, Jap).

The colors of crude drugs were specified by the CIE 1976 L*a*b* color system. Ginseng (*Panax ginseng*, *P. japonicus*) powders of various grades prepared by different procedures were successfully distinguished from each other by their own specific colors. By analyzing the colors of powdered drugs, it is possible to know grades and qualities of crude drugs.

9205-3406 Muir, A.D., Goplen, B.P. (Agriculture Canada Research Station, 107 Science Place, Saskatoon, Saskatchewan S7N 0X2, Canada) **Quantitative reversed-phase HPLC analysis of dicumarol in sweetclover hay and silage samples.** *Journal of Agricultural and Food Chemistry*, v. 40(5): p. 820-823, 1992 (23 ref, Eng).

A quantitative high performance liquid chromatographic method was developed for determining dicumarol, a fungal-produced anticoagulant, in spoiled sweetclover hay and silage. Samples (1g) were extracted in 1,2-dichloroethane/phosphate buffer, and the 1,2-dichloroethane phase was purified through a silica column prior to reversed-phase HPLC chromatography using a sodium acetate/methanol (25:75) eluent with UV detection at 303 nm. Recoveries of dicumarol standards subjected to the extraction and purification procedure were 116 percent and 96 percent for 20 and 50 ppm solutions, respectively. The SE of replicated analysis of a spoiled sweetclover sample was 5 percent (n=8) with 115 percent recovery of dicumarol added to samples prior to extraction. Analysis time was 6-8 min, and the minimum detectable concentration was 2 ppm. This method uses 10 percent of the sample and solvent required by previous methods and is adaptable to automation, allowing a significant increase in the sample through.

9205-3407 Petri, G., Dobson, S., Then, M. (Simmelweis Medical University, Institute of Pharmacognosy, Budapest, Hungary) **IR Spectroscopic determination of linalyl acetate in the essential oil of *Salvia sclarea*.** *Planta Medica*, v. 57(Supplement 2): p. A138-A139, 1991 (3 ref, Eng).

A new method for the determination of linalyl acetate in the essential oil of *S. sclarea* has been described.

9205-3408 Prabhakar, Y.S., Narmatha, V., Sudesh Kumar, D. (Division of Medicinal Chemistry, CDRI, Lucknow 226001, UP, India) **A spectroscopic approach to the pharmacognosy of *Wadelia calendulacea* Less and *Eclipta alba* (L.) Hassk.** *Aryavaidyan*, v. 5(4): p. 227-231, 1992 (11 ref, Eng).

Comparative pharmacognosy of *W.calendulacea* and *E.alba* is attempted. While microscopic details, ash and nitrogen values did not show significant differences, fluorescence characteristics, UV absorption and TLC patterns of the plant extracts exhibited striking dissimilarities, which can be used as pharmacognostic tools. NSL, New Delhi.

9205-3409 Sadler, G.D., Braddock, R.J.(University of Florida, IFAS, Citrus Research and Education Center 700 Experiment Station Road, Lake Alfred, FL, 33850, USA) **Absorption of citrus flavour volatiles by low density polyethylene.** *Journal of Food Science*, v. 56(1): p. 35-37, 1991 (15 ref, Eng).

The volatiles selected for examination were d-limonene, alpha-pinene, myrcene, alpha-terpineol, linalool, ethyl butyrate, citral, octanal. Low density polyethylene (LDPE) sample was mounted on an oxygen electrode. As volatiles absorbed, oxygen permeation through the polymer increased. Limonene, ethyl butyrate, myrcene, and alpha-pinene were readily absorbed by LDPE. Octanal, citral, linalool and alpha-terpineol were absorbed at much lower levels.

9205-3410 Shelby, R.A., Kelley, V.C.(Department of Plant Pathology and Botany, Auburn University, Auburn University, Alabama 36849, USA) **Detection of ergot alkaloids from *Claviceps* species in agricultural products by competitive ELISA using a monoclonal antibody.** *Journal of Agricultural and Food Chemistry*, v. 40(6): p. 1090-1092, 1992 (23 ref, Eng).

A competitive inhibition enzyme-linked immunosorbent assay (CI-ELISA) was developed which was able to detect ergot alkaloids in seed and flour at the picograms per gram level. A monoclonal antibody (MAb) directed against ergonovine was found to be sensitive to these secondary metabolites of *Claviceps* spp. having an intact ergoline moiety in wheat, bahiagrass, bluegrass, and tall fescue seeds. The assay could detect the alkaloids of *Claviceps purpurea* when sclerotia were diluted 10/5 by weight in whole wheat flour, or approximately one sclerotium in 20 kg of wheat. Ergonovine added to ergot-free wheat flour was detected at 10ng/g. Total elapsed time for the assay is 1.5 h for 96 samples in the microplate format.

9205-3411 Shin, K.H., Kang, S.S., Chi, H.J.(Natural Products Research Institute, Seoul National University, Seoul 110460, Korea) **Analysis of the coumarin constituents in *Peucedanii Radix*.** *Korean Journal of Pharmacognosy*, v. 23(1): p. 20-23, 1992 (8 ref, Kor).

A new method for the analysis of coumarin constituents in the roots of *Peucedanum japonicum* by high

performance liquid chromatography has been reported. Among two coumarin constituents identified, peucedanol was confirmed to be applicable to a standard compound. A reversed phase system with a micro Bondapak C18 column using H₂O-MeOH=5:4 as a mobile phase was developed. Peucedanol and a minor constituent, umbelliferone were detected at 333 nm and the analysis was successfully carried out within 20 min.

9205-3412 Sinha, N.K., Guyer, D.E., Gage, D.A., Lira, C.T. (Departments of Agricultural Engineering, Biochemistry and Chemical Engineering, Michigan State University, East Lansing, Michigan 48824, USA) **Supercritical carbon dioxide extraction of onion flavors and their analysis by gas chromatography- Mass spectrometry.** *Journal of Agricultural and Food Chemistry*, v. 40(5): p. 842-845, 1992 (23 ref, Eng).

Extraction with supercritical carbon dioxide (SC-CO₂) produced fresh onion-like flavor components from onions. Combined gas chromatography-mass spectrometry analysis of SC-CO₂ onion extract showed the presence of 28 sulfur-containing compounds, including diallyl thiosulfinate (or its isomer, di-1-propenyl thiosulfinate), propyl methanethiosulfonate, dithiin derivatives, diallyl sulfide, diallyl trisulfide, and 6 other tentatively identified compounds. A commercial steam-distilled onion oil analyzed under similar conditions did not contain detectable amounts of the compounds listed above but did have 13 other compounds in common with the SC-CO₂ onion extract. The flavor compounds methyl propyl trisulfide, dipropyl trisulfide, and dipropyl tetrasulfide were detected only in the commercial steam-distilled onion oil and were present in high concentration.

9205-3413 Sokol, M., Burczyk, J.(Zaklad Farmakognozji, Slaska Akademia Medyczna, ul. Jagiellonska 4, 41-200 Sosnowiec, Polska) **Determination of biological activity of substances using phytopharmacological plant tests.** *Herba Polonica*, v. 36(4): p. 175-180, 1990 (56 ref, Eng, Pol).

The *Allium* test serves to a preliminary estimation of antimycotic activity of biologically active substances. The important advantage is observation of morphological and anatomical changes in an onion root tissue, and how the test substance affects a course of mitotic processes occurring in a meristematic tissue. Utilizing this test, a number of natural substances with antimutagenic properties have been described. They confirm the usefulness of the method to the preliminary activity estimation of different synthetic and natural compounds and preparations, for example ethanolic extracts of propolis.

9205-3414 Sun, X., Kizu, H., Tomimori, T.* (School of Pharmacy, Hokuriku University, Ho-3, Kanagawa-machi, Kanazawa 920-11, Japan) **Quantitative analysis of timosaponin B-II, timosaponin A-III and the mangiferin in Anemarrhenae Rhizoma and Kampo prescriptions containing this crude drug.** *Shoyakugaku Zasshi*, v. 46(1): p. 19-24, 1992 (13 ref, Eng, Jap).

A high-performance liquid chromatographic (HPLC) method was established for the quantitative analysis of timosaponin B-II (I), timosaponin A-III (II) and mangiferin (III) in *Anemarrhenae Rhizoma*. This method was also applied to determination of these compounds in four kinds of Kampo Prescriptions containing *Anemarrhenae Rhizoma* (*Anemarrhena asphodeloides*). This method is considered to be useful for the chemical evaluation of commercially available *Anemarrhenae Rhizoma* and Kampo Prescriptions containing this crude drug.

9205-3415 Suto, K., Masuda, M., Maruta, T., Sagara, K.*, Mizutani, T. (Research Center, Taisho Pharmaceutical Company Limited, 1-403 Yoshino-cho, Omiya-shi, Saitama 330, Japan) **Application of supercritical fluid extraction and chromatography to determination of paeoniflorin and albiflorin in Paeoniae Radix.** *Shoyakugaku Zasshi*, v. 46(1): p. 9-13, 1992 (4 ref, Eng, Jap).

Determination of paeoniflorin and albiflorin contents in *Paeoniae Radix* (*Paeonia albiflora*) by supercritical fluid extraction and chromatography (SFE and SFC) is described. *Paeoniae Radix* was subjected to SFE with carbon dioxide containing methanol and water. The extract was trapped in a volumetric flask and the flask was filled up with a mixture of water and methanol. This solution was then analysed on a silica gel column by SFC using carbon dioxide containing methanol as the mobile phase and UV absorption monitoring at 230 nm.

9205-3416 Valka, I. (Institute of Medical Chemistry, Medical Faculty of the Palacky University, Allende 3, 775 15 Olomouc, Czechoslovakia) **Methods of isolation and determination of isoquinoline alkaloids.** *Acta Universitatis Palackianae Olomucensis (Olomouc), Facultatis Medicae*, v. 124 (Supplement 17): p. 73-102, 1989 (174 ref, Eng, Cze).

Common procedure of isolation of isoquinoline alkaloids and the novel separation techniques are discussed and exemplified. The methods used for determination of isoquinoline alkaloids have been reviewed, including GC, HPLC, TLC, immunochemical methods and some special techniques. The selected examples of application have been discussed.

9205-3417 Wijaya, H., Nishimura, H., Tanaka, T., Mizutani, J. (Department of Agricultural Chemistry, Faculty of Agriculture, Hokkaido University Papporo 060, Japan) **Influence of drying methods on volatile sulfur constituents of caucas (*Allium victorialis* L.).** *Journal of Food Science*, v. 56(1): p. 72-75, 1991 (24 ref, Eng).

The effects of freeze drying, hot air and vacuum for infrared-drying on caucas, (*Allium victorialis*), flavor was studied. The GC and GC-MS characterisation of volatiles from dried caucas powder revealed the main flavor components, disulfides and trisulfides, as well as, antithrombotic substances, vinyl dithiols, remained, in all products. Vinyl dithiols were isolated and subsequently confirmed by IR, NMR and mass spectrometry. Rehydration of the dried powders increased measurable volatile compounds in freeze dried and hot air dried caucas powders, while the volatile profile remained unchanged.

Miscellaneous

9205-3418 . Capers-a monograph. *Lawrence Review of Natural Products*, pp. 1, April, 1992 (2 ref, Eng).

Capers (*Capparis spinosa*) are best known as spices used in Mediterranean cooking. Not used widely in herbal medicine, extracts of the buds and the plant have been used for the treatment of some topical skin disorders. Capers may induce dermatitis. Botany, history, chemistry, pharmacology and toxicology of *C. spinosa* have been briefly reviewed.

9205-3419 . Fo-Ti-a monograph. *Lawrence Review of Natural Products*, pp. 1, April, 1992 (3 ref, Eng).

Fo-Ti (*Polygonum multiflorum*), is a popular Chinese herbal product. In the United States, it is best known for inclusion in Cathartic products due to the activity of anthraquinone compounds. Botany, history, chemistry, pharmacology and toxicology of Fo-Ti have been briefly reviewed.

9205-3420 . Aloe- a monograph. *Lawrence Review of Natural Products*, pp. 3, April, 1992 (26 ref, Eng).

Aloe products derived from the latex of the outer skin are drastic cathartics to be used with caution. Compounds derived from the inner gel intended for internal administration have not been shown to exert any consistent therapeutic effect. Gel is a potential therapeutic agent in the treatment of minor burns and wounds. Botany, history, chemistry, pharmacology and toxicology of *A. vera*, *A. perryi*, *A. barbadensis*, *A. vulgaris* and *A. ferox* have been reviewed.

9205-3421 Ahmad, M. (Department of Pharmacognosy, Faculty of Pharmacy, University of Karachi, Karachi

75270, Pakistan) **Valerian, a drug ignored by us.** *Hamdard Medicus*, v. 35(1): p. 80-85, 1992 (11 ref, Eng).

Morphological and anatomical characters, chemical constituents, biological activities and economic uses of *Valeriana* species have been reported.

9205-3422 Akerele, O.(Traditional Medicine, World health Organization, Geneva, Switzerland) **WHO Guidelines for the assessment of herbal medicines.** *Fitoterapia*, v. 63(2): p. 99-110, 1992 (Eng).

The fourth and fifth International Conferences of Drug Regulatory Authorities, held in Tokyo(1986) and Paris(1989) respectively, organized workshops on the regulation of manufactured herbal medicines moving in international commerce. Both workshops concentrated on the commercial exploitation of herbal medicines through over-the-counter labelled products. The Paris meeting concluded that the World Health Organization should consider preparing model guidelines containing basic elements of legislation designed to assist countries wishing to develop appropriate legislation and registration. This presentation outlines the background to, and the process by which the Organization has responded to this request.

9205-3423 Bedoukian, P.Z.(Bedoukian Research Inc., Finance Drive, Danbury CT 06810, USA) **Bedoukian's 48th Annual Review: Perfumery and flavor materials.** *Perfumer & Flavorist*, v. 17(3): p. 1-30, 1992 (378 ref, Eng).

Developments in the field of perfumery and flavour materials have been reviewed under the following sub-headings: promotion and sales of fragrances, collecting scent bottles, fragrances in the media, research in olfaction, essential oil production, symposiums and meetings, extraction of essential oils with supercritical carbon dioxide, reports on sweeteners, reports on flavors, studies on sulfur compounds, dairy products, other studies on flavors, vegetable flavors, research on various flavours and their characteristics, meat and marine flavors, Maillard reaction products, seafood flavors, coffee and tea flavors, fruit flavors, research in essential oils, reports on monoterpenes, reports on aroma chemicals, terpene hydrocarbons, monocyclic terpenoids, polycyclic terpenes, delta-lactones, ionones and related compounds, musk and amber compounds, cis-jasmone and related compounds and books and publications.

9205-3424 Bone, K.(Medicinal Herba Private Limited, PO Box 713, Warwick 4370, Australia) **Turmeric- The spice of life ?.** *British Journal of Phytotherapy*, v. 2(2): p. 51-60, 1991 (75 ref, Eng).

The rhizome of *Curcuma longa* has been used as a medicine, spice and a colouring agent since time immemorial. An account of pharmacological and clinical studies (anti-inflammatory, antiplatelet, antioxidant, hypocholesterolaemic effects on digestive tract, antimicrobial, anticancer activities, pharmacokinetics, toxicity) therapeutic indications, contra indications and precautions of *C.longa* as well as of curcumin, the active principle has been given.

9205-3425 Broderick, J.J.(189 Woodland Avenue, River Edge, NJ 07661-2322, USA) **Reflections of a retired flavorist before he forgets: Strawberry.** *Perfumer & Flavorist*, v. 17(3): p. 33-34, 1992 (1 ref, Eng).

Historical account of development of strawberry flavour has been briefly discussed. Use of methyl heptine carbonate, maltol and aldehyde C16 in the development of the flavour has been mentioned. The demand for "natural" flavours and the availability of "natural" ingredients now enables the flavorist to produce a "natural" strawberry with a minimum of juice or fruit extractives. It also verifies that Aldehyde C16 is not a necessary ingredient.

9205-3426 Brooks, D.N.(Regional Audiology Unit, Withington Hospital, West Didsbury, Manchester M20 8LR, England) **An onion in your ear.** *British Journal of Phytotherapy*, v. 2(2): p. 72-75, 1991 (25 ref, Eng).

An account of the genus *Allium* i.e. onion and garlic in the treatment of ear ailments in folklore and as reviewed in literature has been given. The major active compounds have been discussed.

9205-3427 Ceci, L.N., Curzio, O.A., Pomilio, A.B.(National Research Council of Argentina, Departamento de Quimica e Ingenieria Quimica, Universidad Nacional del sur, Av. Alem 1253, 8000 Bahia Blanca, Argentina) **Effects of irradiation and storage on the flavor of garlic bulbs cv "Red".** *Journal of Food Science*, v. 56(1): p. 44-46, 1991 (20 ref, Eng).

The effects of 50 Gy gamma irradiation for 30 days after harvest, on the flavour of garlic bulbs cv. red, during storage at room temperature for 300 days were evaluated. The contents of sulphur compounds and enzymatic pyruvate (EP) were determined by GLC and spectrophotometry. Upon comparison of irradiated and nonirradiated bulbs, no differences were observed in the contents of EP, cyclic disulfide compounds 144-I+144-II (GLC induced rearrangement products of allicin) and {diallyl disulfide (DADS)}. At the end of the storage both sample showed the significant reduction in 144-I+144-II and EP. On the contrary, DADS underwent an increase in both treatments.

9205-3428 Coleman, W.M.(R J Reynolds Tobacco Company Bowman Gray Technical Center, Winston-Salem, NC 27102) **The volatile and semivolatile components of supercritical fluid and methylene chloride extracts of selected tobaccos.** *Journal of Essential oil Research*, v. 4(2): p. 113-120, 1992 (13 ref, Eng).

The major volatile and semivolatile components of both the supercritical fluid and methylene chloride extracts are nicotine, neophytadiene and hexadecanoic acid comprising approximately 85 percent by weight. Acids, ketones, amines and alcohols comprise the balance of the volatile and semivolatile components. All of the components of the extracts (supercritical fluid or methylene chloride) identified in this study have been previously identified in tobacco and/or tobacco smoke. The qualitative nature of these extracts is similar to those previously reported. The supercritical fluid extraction (SFE) approach provides a significant improvement over currently employed techniques such as solvent and Soxhlet extractions.

9205-3429 Collisson, R.J.(3 Chatsworth Avenue, Wimbledon Chase, London SW 208 JZ, England) **Siberian ginseng (*Eleutherococcus senticosus* Maxim.).** *British Journal of Phytotherapy*, v. 2(2): p. 61-71, 1991 (53 ref, Eng).

E.sinticosus has long been used in traditional Chinese medicine and has quite different indications from *Panax ginseng* within that system. An account of its botany, active trials, roles in oncology and pharmacy, therapeutic indications, etc. has been given.

9205-3430 Fouche, P.E.(3, Rue du Mont-Roti, F 78550 Houdan, France) **Alkaloids and industry, today.** *Annales Pharmaceutiques Francaises*, v. 49(5): p. 244-248, 1991 (1 ref, Fre, Eng).

The importance of alkaloids and heterosides extracted from plants is well established. A specialized industry makes them available to drug companies by means of technological processes which make a wide range of extractions possible. Economics of processes and limitations of raw material availability have been discussed.

9205-3431 Mosciano, G Fasano, M., Michalski, J., Sadural, S. (Bush Boake Allen, 7 Mercedes Drive, Montvale, NJ 07645, USA) **Organoleptic characteristics of flavor materials.** *Perfumer & Flavorist*, v. 17(3): p. 57-59, 1992 (Eng).

Source, FEMA no, CAS no, synonyms, occurrence, odor characteristics, taste characteristics and suggested applications of 20 flavouring materials including bannana essence 900 fold 535, cucumber essence 300 fold, genet absolute, geranyl acetate, cineole, isobutyl benzoate, mas-

soia lactone critical carbon dioxide extract, orris resinoid, saffron resinoid and tuberose TA 1050 have been described.

9205-3432 Nair, K.V., Nair, A.R., Nair, C.P.R.(Regional Research Institute (D.R.) Pooja Pura, Thiruvananthapuram 12, Kerala,India) **Techno/economic data and cultivation preservation of some south Indian medicinal plants.** *Aryavaidyan*, v. 5(4): p. 238-240, 1992 (Eng).

The paper provides data for requirements of crude drugs/raw materials for Ayurvedic preparations in South India. Some thirty-seven plants have been listed, highlighting mainly on the name of the drug, in Ayurveda, trade name, quantities required by some major south Indian pharmacies, part of the plant used, and price per kg. NSL, New Delhi.

9205-3433 Neumann, M., Garcia, N.A.(Departemento de Quimica y Fisica, Universidad Nacional de Rio Curato, 5800 Rio Cuarto, Argentina) **Kinetics and mechanism of the light-induced deterioration.** *Journal of Agricultural and Food Chemistry*, v. 40(6): p. 957-960, 1992 (21 ref, Eng).

The kinetics and mechanisms involved in the light-induced photodegradation of lemon oil (LO) have been investigated using singlet molecular oxygen {O₂(1Δ_g)} time-resolved phosphorescence detection and steady-state irradiation, in organic and micellar aqueous solutions. A parallel study on the kinetics of limonene(L) photooxidation was carried out, for comparative purposes. An O₂(1Δ_g)-mediated photooxidative process (autosensitization) takes place in LO both in the absence and in the presence of external of lemon oil sensitizers. In the former case the pigments present in LO itself efficiently sensitize the generation of O₂(1Δ_g) with a quantum yield of 0.14 L and other minor components of LO {especially the terpenes, efficient O₂(1Δ_g) quenchers} are responsible for the photodegradation. Upon direct irradiation of LO in the wavelength range 300-350 nm an additional photochemical process operates: the decomposition proceeds from electronically excited states of LO susceptible components, which prevails over the competitive o₂(1Δ_g) mechanism.

9205-3434 Nurul Islam, Khan, A.S.(Dye and Pigment Section, BCSIR Laboratories, Dhaka, Bangladesh) **Piece dyeing of cotton fabrics with myrobalan fruits.** *Bangladesh Journal of Scientific and Industrial Research*, v. 26(1-4): p. 175-187, 1991 (Recd. 1992, 2 ref, Eng).

Piece dyeing of cotton fabrics with finely powdered Myrobalan fruits (*Terminalia chebula*) was achieved. A small variation in experimental parameters of different combinations of dye and the mordant creates possibility of

achieving numerous tonal nuances. Application of destructive agents on the dyed sample showed the fastness of the dye.

9205-3435 Pan, Q.M., Chen, G.I.(Institute of Integrated Traditional Chinese and Western Medicine, Human Medical University, Changsha 410 008, China) **An epidemiological survey on liver diseases of traditional Chinese medicine.** *Chinese Journal of Integrated Traditional and Western Medicine*, v.11(3): p. 153-155, 1991 (5 ref, Eng).

The paper reports the results of epidemiological survey about liver diseases of traditional Chinese medicine(TCM). It surveyed 5606 patients at general hospitals, and 1013 (18.07 percent) of them were patients with liver diseases(TCM), including 61 cases of liver Qi depression syndrome, 215 cases of liver depression and Spleen deficiency syndrome, 135 cases of liver and gallbladder damp-heat syndrome, 79 cases of liver Fire flaming syndrome, 145 cases of liver Yang rising syndrome, 209 cases of liver Wind agitation syndrome, 62 cases of liver blood deficiency syndrome, 86 cases of liver kidney Yin deficiency syndrome and 21 cases of liver cold syndrome.

9205-3436 Robinson, H.M.(82, Rollingwood Circle, London Ont., Canada, N6G 1P7, Canada) **Vinca revisited-another happenstance in the discovery of vinblastine.** *Biochemistry and Cell Biology*, v. 69(9): 581-582, 1991 (5 ref, Eng).

The role of chance observations in the discovery of vinblastine as a chemotherapeutic agent against cancer, historical accuracy etc. have been highlighted.

9205-3437 Verzera, A., Cotroneo, A., d'Alcontres, I.S., Donato, M.G.(Dipartimento Farmaco-Chimico, Facolta di Farmacia, Universita di Messina, Messina, Italy) **On the genuineness of essential oils. Part XXX. Detection of distilled essential oils added to cold-pressed mandarin essential oils.** *Journal of Essential Oil Research*, v. 4(3): p. 273-280, 1992 (6 ref, Eng).

The results of 266 analysis of cold-pressed mandarin oil, 29 analysis of distilled mandarin oil and 26 analysis of mixtures of 5-20 percent of distilled oil mixed with cold-pressed oil are presented. Component ratios of terpinen-4-ol with cis-sabinene hydrate, trans-sabinene hydrate, citronellal and decanal have been used to detect the additions of the less valued distilled oil in the cold-pressed oil. In most cases the component ratios found in mixtures of 10 percent distilled oil in cold-pressed oil can be used to infer that such a mixture has taken place.

9205-3438 Walton, N.J.(Department of Genetics and Microbiology, AFRC Institute of Food Research, Norwich Laboratory, Norwich Research Park, Colney, Norwich NR47UA) **Five chemical harvest.** *Chemistry in Britain*, v. 28(5): p. 525-529, 1992 (27 ref, Eng).

Importance of plants as source of chemicals and pharmaceuticals has been highlighted. A multidisciplinary approach is needed to harness the vast chemical potential of the world's disappearing plant species. Some promising plants which yield important chemicals are: *Artemisia annua* (artemisinin, antimalarial), *Castanospermum australe* (castanospermine, anti HIV activity), *Ginkgo biloba* (gingkolides, antiinflammatory), *Catharanthus roseus* (vincristine and vinblastine, antileukemic), *Murraya paniculata* (yeuhchukene, antiimplantation).

New Publications

9205-3439 (National Herbalists Association of Australia, PO Box 65, Kingsgrove NSW 2208, Australia) **Australian Journal of Medical Herbalism.** *British Journal of Phytotherapy*, v. 2(2): p. 94, 1991 (Eng).

Australian Journal of Medical Herbalism is a quarterly publication. Regular features include Australian medicinal plants MEDPLANT abstracts, Government Reports, Case studies, Book reviews, Notification of conferences and Conference Reports.

9205-3440 Chadwick, D., Marsh, J.(John Wiley & Son Chichester) **Bioactive compounds from Plants. Ciba Foundation Symposium. Eng. 1990, 242 p., 56 fig., 13 tables. ISBN 0471 926914.** *Bulletin de la Societe Botanique de France, LettresBotaniques*, v. 138(3): p. 263-264, 1991 (Eng).

This publication presents the communications of the Ciba Foundation Symposium held at Bangkok in February 1990. The 14 chapters emphasize the role of ethnopharmacology in the discovery of new drugs and the role of secondary metabolites in defence mechanism. Structural analyses of some plant metabolites and economics of the production of the metabolites have been discussed.

9205-3441 Chatterjee, A., Pakrashi, S.C.(Publications & Information Directorate, KS Krishnan Marg, New Delhi 110012, India) **Treatise on Indian Medicinal Plants. Vol. 1 (Eng, p. 172, Rs. 250.00, 1991, ISBN 81-7236-01108.** (Eng).

The present volume is the first in the series on the Treatise on Indian Medicinal Plants (6 volumes), covers one hundred and eleven plants classified according to the latest botanical nomenclature. Write up on each plant included vernacular names, occurrence, distribution, botanical

description, therapeutic uses and chemical components with references. Chromatological development in Ayurveda and its relevance to modern materia medica have been discussed. The distinctive feature is the inclusion of Sanskrit Shlokas (Devanagari and Roman scripts) explaining the therapeutic uses of plants. Glossaries of Sanskrit/Ayurvedic and Medical terms, and list of books refereed have been given.

9205-3442 Crellin, J.K., Philpott, J.(Duke University Press, Durham) **Herbal Medicine. Vol. 2- A Reference Guide to Medicinal Plants** (Eng. pp. 549, price \$ 19.95, cloth \$ 59.50, ISBN 08223 10198). *Journal of Scientific & Industrial Research*, v. 51(4): p. 349-351, 1992 (Eng).

The second volume of Herbal Medicine encompasses a broad coverage of plants known to A.L. Tommie Bass on whose works the present volumes are based. This volume includes plants indigenous, naturalized, domestic and sometimes foreign to USA. The volume reflects study on ethnobotany and ethnopharmacology, evaluating the use of drugs in cultural settings. The plants have been listed alphabetically according to a well known vernacular name, subsequently botanical name, synonyms, historical account, chemical constituents and comments on verbal accounts by Bass have been provided.

9205-3443 Crellin, J.K., Philpott, J.(Duke University Press, Durham) **Herbal Medicine, Past and Present, Vol.1- Trying to Give Ease** (Eng, pp. 335, price \$ 35.00, cloth, ISBN 0822308 7708770). *Journal of Scientific & Industrial Research*, v. 51(4): p. 349-351, 1992 (Eng).

The two volumes on Herbal Medicine are based on the works of AL. Tommie Bass and his practice of administering herbal drugs. The first volume "Trying to Give Ease" provides historical perspectives covering history and traditions of therapeutics, verbal commutum of Bass, aspects of Bass life, salient features of his advice and herbal recommendations and responses of his visitors. The book gives an account of the folk-lore information and also the utilization of herbal drug collected locally and preparation of medicines, as advocated by Bass.

9205-3444 Pelletier, W.S.. **Alkaloids. Chemical and biological perspectives. Volume 7**, Ed. Pelletier WS, Springer-Verlag, NY, 1991, xv+591 PP, 16.5x24cms, 98.00 dollars. *Journal of Medicinal Chemistry*, v. 34(12): p. 3409 , 1991 (Eng).

The book focuses on 3-groups of alkaloids viz. the homoerythrina group and related compounds, steroidal alkaloids, and nor-diterpenoid alkaloids. The chapter on homoerythrina alkaloids summarizes current state of chemical knowledge and had been isolated as natural products,

they are related to compounds known to have powerful physiological activity. However, in the case of other two alkaloids, mostly compilations pertaining to the spectral data viz., ¹³C-NMR data and structural interpretations of these compounds are given. This book is quite useful to natural product chemist's in particular alkaloid chemist's.

Patents

9205-3445 Akiyoshi, M., Tetsuro, Y. , Katsuhisa, H., Tsuneo, T., Yoko, S.(Chlorine Engineers Corporation Limited and Yakult Housha Company Limited) **Process for supercritical extraction and separation of solid samples such as ginkgo leaves**, Eur.Pat.Appl.EP 308,675 (Cl. B01 D11/02), 1989, 6PP. (Eng).

Physiologically active components from Ginkgo leaves are extracted from the leaves in high yields. At first ethanol extracts of powdered leaves were treated with super critical carbon-di-oxide. By following this procedure the amount of toxic substances can be minimised. The super-critical fluid is then allowed to pass from the extractor through a decompressor and separator. The starting material containing 2.8 percent of both Kaempferol and quercetin and 2.0 percent of toxic substances yielded by this method at 70 degree C.

9205-3446 Emanuel, R.(Avram, Elena) **Tung oil compositions and use for treatment for body deficiencies**, US US 4,851,437 (Cl. 514-529; A61K31/215), 1989, 3PP. (Eng).

A method for the treatment of symptoms of a body deficiency caused by an anabolic constructive imbalance without treating the deficiency itself is described. It comprises of administering 50-500 mg of a tung oil, an ester of a tung oil fatty acid or an ester of a PUFA 50-95 percent or polyunsaturated oil in an appropriate pharmaceutical composition. Tung oil compositions administered to a patient suffering from the symptoms of the deficiency for quite some time will be benefited in alleviating more than one symptoms. The composition comprising tung oil 20 wt percent and safflower oil 80 wt percent is normally administered orally at the dose level of 50-500 mg (oil mixture) twice daily.

9205-3447 Jiro, A., Junichiro, A., Kazuhiro, I., Schinichiro, K. (Advance Company Limited , Japan) **5-Lipoxygenase-inhibiting furoquinoline derivatives as allergy inhibitors**, Japan Kokai Tokkyo Koho JP 01,40,427 (Cl. A61 K31/47), 1989, 4PP. (Jap, Eng).

5-Lipoxygenase inhibitors, which are useful as allergy inhibitors are shown to be furoquinoline derivatives of I and II (R1=OH, OMe, OAc; R2=H, CH₂CH=CH₂ etc. in the given structural formula) also (R3=H, OMe; R4,R5=H,

OH, OMe etc. in the given structural formula). the furoquinoline, viz., *Teclea verdoornine* (I; $R_1=OH$, $R_2=CH_2CH=CMe$, $R_3=OMe$ in the given structural formula) has been isolated from the medicinal plant *Teclea verdoorniana*, showed IC₅₀ of 0.3 microM against 5-lipoxygenase, as determined by the modified Koshihara method. The compounds I and II have a LD₅₀ greater than 1000 mg/kg in mice.

9205-3448 Karl, R., Gerhard, S. (Mucos Pharma G.m.b.H and Company) **Use of catabolic enzymes in the treatment of AIDS and its early stages (LAS, ARC), Eur.Pat.Appl.EP 309,602 (Cl. A61 K37/54), 1989, 7PP.** (Ger, Eng).

Catabolic enzymes (hydrolases and proteases) are used for the treatment of AIDS and Pre-AIDS. Patients testing positive for HIV and showing symptoms of AIDS, AIDS-related complex, or lymphadenopathy syndrome were treated with various regimens of Wobe-Mugos tablets, suppositories and injections containing trypsin, chymotrypsin, papain, lipase, amylase and rutin for 23 months. The patients showed an improvement in T4/T8 cell ratio and in clinical condition.

9205-3449 Mikio, Y., Yukio, M., Nobuhisa, I., Toshuki, K. (Eisai Company Limited, Japan) **Germacrone as central nervous depressant, Japan Kokai Tokkyo Koho JP 01,139,527, (Cl. A61 K31/12), 1989, 8PP.** (Jap, Eng).

Germacrone was isolated from *Curcuma xanthorrhiza*. The compound exhibited central nervous system depressant activity. At the dose level of 3mg/kg, when administered i.p. to mice inhibited methamphetamine-induced hyperkinesia, indicating central nervous depressant activity.

9205-3450 Mitsuo, M., Takaomi, O. (Sanwa Seiyaku Company Limited, Japan) **Diuretic protost-13(17)-ene-3,16-diones from Alismataceae.** (Jap, Eng).

Diuretic compounds viz., protost-13(17)-ene-3,16-diones ($R_1-R_4=H$, Ac in the given structural formula) has been isolated from Alismataceae. Two kg material belonging to the plant family Alismataceae was pulverized and thoroughly refluxed with 6 litres of methanol. The extract was concentrated to give 400 gm. of residue. The residue was dissolved in water (300 litres) and aqueous solution was successively extracted with 300 ml ether followed by washing ether extract with 100 ml 1N NaOH. The extract was concentrated under reduced pressure to give 58 gm. of residue. The residue was chromatographed over silica gel column with CHCl₃-acetone (2:3) solvent system to give

diuretic compound. ($R_1=R_2=R_4=H$ in the given structural formula).

9205-3451 Robert, W.B. (Immunet) **Immunotoxin for allergy therapy, Japan Kokai Tokkyo Koho JP 01,102,032 (Cl. A61K39/35), 1989, 8PP.** (Jap, Eng).

The A-chain of an antiviral protein from pokeweed (PAP) is bound to a monoclonal antibody (IgE isotype-specific) to form an immunotoxin for allergy therapy. Thus, goat antimouse IgE antibody was treated with PAP to give an immunotoxin useful as an antiallergy agent.

9205-3452 Sachiko, T., Kuniko, Y., Mitsukatsu, S., Yoshikai, Y. (Sanraku Incorporation; Ikehan More K.K.) **Preparation of Hibiscus extract, Japan Kokai Tokkyo Koho JP 01,26,676, (Cl. C09 B61/00), 1989, 4PP.** (Jap, Eng).

A health drink from *Hibiscus* spp. free from bacterial contamination and resistant to discolouration has been described. The drink is mainly prepared from the sepal using water and ethanol solution as the main extractants. The health drink can be stored at 10 degree C for nearly 2 months without much of a change or without bacterial contamination.

9205-3453 Toshiharu, M., Masaya, I., Keiji, U. (Nippon Flour Mills Company Limited) **Novel antitumor substances from betelnut, Japan Kokai Tokkyo Koho JP 63,307,892, (Cl. C07 G17/00), 1988, 24PP.** (Jap, Eng).

NF-86I, NF-86II, NPF 86IA, NPF-86IB, NPF-86IIA and NPF 86IIB were isolated from betel nuts. The physico-chemical properties of the composition and specified elemental compositions of these compounds were determined and are described to be novel neoplasm inhibitors. NF-86I at the dose level of 10 mg/kg administered i.p. to Ehrlich ascites carcinoma-bearing ICR male mice for 10 days markedly inhibited the carcinoma growth.

9205-3454 Yoshitake, O., Makoto, I., Junichi, N. (Eisai Company Limited, Japan) **Cubebin for prophylactic and therapeutic treatment of liver disease, Japan Kokai Tokkyo Koho JP 01,180,824, (Cl. A61 K31/36), 1989, 3PP.** (Eng).

Dried leaves of *Cinnamomum porrectum* when refluxed with methanol, and the extract was treated with water and an ester. The organic phase was separated and chromatographed on silica gel to give a compound cubebin. Cubebin, when administered at the dose level of 100 mg/kg body wt. to rats with D-galactosamine-induced liver disorder showed improvement as reflected by blood coagulation

time and serum glutamate-oxalate transminase level. At higher dose level of 300 mg/kg body wt., the compound showed no signs of acute toxicity, in mice. Cubebin is useful for prophylactic and therapeutic treatment of liver disorder.

List of Serials Abstracted

Volume 14(5), 1992

1. Acta Pharmaceutica Nordica, 1992, 4(2)
2. Acta Pharmaceutica Sinica, 1991, 26(10,12)
3. Acta Universitatis Palackianae Olomucensis (Olomous), Facultatis Medicae, 1989, 122,123,124(Supplement 17)
4. Angewandte Botanik, 1991, 65(5/6)
5. Animal Research and Development, 1991, 34
6. Annales Pharmaceutiques Francaises, 1991, 49(5)
7. Aryavaidyan, 1992, 5(3,4)
8. Australian Veterinary Journal, 1992, 69(4)
9. Ayu, 1991, 12(5)
10. Bangladesh Journal of Scientific and Industrial Research, 1991, 26(1-4)
11. Biochemistry and Cell Biology, 1991, 69(9)
12. Bioscience, Biotechnology and Biochemistry, 1992, 56(1,4)
13. Botanical Bulletin Academia, 1992, 33(1)
14. Botanical Review, 1990, 56(1); 1991, 57(3)
15. British Journal of Phytotherapy, 1991, 2(2)
16. Bulletin de la Societe Botanique de France, Lettres Botaniques, 1991, 138(3); 1992, 139(1)
17. Canadian Journal of Botany, 1992, 70(1)
18. Canadian Journal of Plant Science, 1991, 71(4)
19. Central African Journal of Medicine, 1991, 37(5)
20. Ceskoslovenska Farmacie, 1991, 40(8-10)
21. Chemical & Pharmaceutical Bulletin, 1992, 40(1,2,3)
22. Chemistry in Britain, 1992, 28(5)
23. Chinese Journal of Animal and Veterinary Sciences, 1991, 22(3)
24. Chinese Journal of Integrated Traditional and Western Medicine, 1991, 11(1,2,3,4,7,8,9)
25. Collection of Czechoslovak Chemical Communications, 1992, 57(3)
26. Fitoterapia, 1992, 63(2,3)
27. Hamdard Medicus, 1992, 35(1)
28. Helvetica Chimica Acta, 1992, 75(3)
29. Herba Polonica, 1990, 36(4); 1991, 37(1)
30. Indian Botanical Contactor, 1992, 9(2)
31. Indian Drugs, 1992, 29(7,8,9)
32. Indian Forester, 1992, 118(4)
33. Indian Journal of Agricultural Sciences, 1992, 62(6)

34. Indian Journal of Cancer Chemotherapy, 1991, 13(2)
35. Indian Journal of Chemistry, 1992, 31B(6,7,8)
36. Indian Journal of Clinical Practice, 1992, 11(2)
37. Indian Journal of Experimental Biology, 1992, 30(3,6)
38. Indian Journal of Genetics & Plant Breeding, 1991, 51(1)
39. Indian Journal of Heterocyclic Chemistry, 1992, 1(5)
40. Indian Journal of Medical Research, 1992, 96B(June)
41. Indian Journal of Natural Products, 1991, 7(2)
42. Indian Journal of Pharmacology, 1992, 24(1)
43. Indian Veterinary Journal, 1992, 69(3,6)
44. International Journal of Tropical Agriculture, 1990, 8(4)
45. Journal of Agricultural and Food Chemistry, 1992, 40(4,5,6)
46. Journal of American Oil Chemists' Society, 1992, 69(2,5,6)
47. Journal of Economic and Taxonomic Botany, 1992, 15(2)
48. Journal of Essential Oil Research, 1992, 4(2,3)
49. Journal of Food Science, 1991, 56(1)
50. Journal of Indian Botanical Society, 1990, 69(3-4)
51. Journal of Medicinal Chemistry, 1991, 34(12)
52. Journal of Natural Products, 1992, 55(4)
53. Journal of Organic Chemistry, 1992, 57(10)
54. Journal of Scientific & Industrial Research, 1992, 51(4)
55. Journal of the Chemical Society of Pakistan, 1991, 13(4)
56. Journal of the Indian Institute of Science, 1991, 71(6)
57. Journal of the Science of Food and Agriculture, 1991, 57(3,4,5)
58. Korean Journal of Pharmacognosy, 1992, 23(1)
59. Lawrence Review of Natural Products, 1992, April
60. Pafai Journal, 1992, 14(1)
61. Pakistan Journal of Scientific and Industrial Research, 1991, 34(10,11)
62. Parfumerie und Kosmetik, 1992, 73(3)
63. Perfumer & Flavorist, 1992, 17(3)
64. Phytochemistry, 1992, 31(5,6)
65. Phytotherapy Research, 1992, 6(3,4)
66. Planta Medica, 1991, 57(Supplement 2); 1992, 58(3)
67. Plantes Medicinales et phytotherapie, 1991, 25(2-3)
68. Polish Journal of Chemistry, 1991, 65(5-6)
69. Polish Journal of Pharmacology and Pharmacy, 1992, 44(1)

70. Probe, 1992, 31(3,4)
71. Proceedings of Indian National Science Academy, 1992, 58B(2&3)
72. Proceedings of the Nutrition Society of India, 1990, 36
73. Progressive Horticulture, 1989, 21(3-4)
74. Science & Culture, 1991, 57(7)
75. Science in China, 1990, 33B(5); 1992, 35B(2)
76. Seed Research 1990, 18(2)
77. Shoyakugaku Zasshi, 1992, 46(1)
78. Vegetable Science, 1990, 17(2)
79. Yakugaku Zasshi, 1992, 112(1,2)
80. Youji Huaxue, 1992, 12(1)
81. Zimbabwe Science News, 1991, 25(1-3)

High T_c Superconductors

Special Issue of the
Indian Journal of Pure & Applied Physics
(Oct - Nov 1992)

To mark The Golden Jubilee of CSIR

Guest Editor	:	Dr A.V. Narlikar
Pages	:	250 (Approx.)
ISSN	:	0019 - 5596
Price	:	Rs.120.00; \$ 28.00; £ 16.00

This special issue presents 21 original research articles written by eminent experts in the frontier areas of research in high temperature superconductors. It essentially focusses on techniques like crystal growth, X-ray absorption and plasma parameters which are immensely useful in studying the high temperature superconducting systems.

Broadly the topics relate to four categories: (i) theory; (ii) materials and physical properties; (iii) characterization and electronic structures; and (iv) thin films and devices.

This issue would not only provide interesting reading but should be a must for all engaged in R&D in material science, solid state electronics, superconductivity, structural chemistry, device engineering and condensed matter physics.

Orders should be accompanied by Money Order or Demand Draft made payable to "Publications & Information Directorate" and sent to:

Sales & Distribution Officer,
Publications & Information Directorate,
Dr K.S. Krishnan Marg,
New Delhi-110012.

Botanical Names Index

- ABRUS PRECATORIUS 3077
 ACACIA AURICULIFORMIS 3338
 ACACIA CATECHU 3105
 ACACIA SPP 2945
 ACANTHACEAE 2781 2905 3024 3316 3351
 ACER NIKOENSE 2993
 ACERACEAE 2993
 ACHILLEA ASPLENIFOLIA 3214
 ACHILLEA COLLINA 3214
 ACHILLEA MILLEFOLIUM 2839 3214 3368
 ACHILLEA ROSEO-ALBA 3214
 ACHILLEA SETACEA 3214
 ACHROSTICHUM AUREUM 2937
 ACHYRANTHES ASPERA 3060
 ACHYRANTHES BIDENTATA 2980
 ACONITUM CARMICHAELI 3219
 ACONITUM FEROX 2885
 ACORUS CALAMUS 2780 3069 3378
 ACTINODAPHNE SESQUIPEDALIS 3094
 ADANSONIA DIGITATA 3289
 ADHATODA VASICA 2781 3316
 AEGLE MARMELOS 3385
 AESCULUS INDICA 2928
 AFRAMOMUM MELEGUETA 3064
 AGASTACHE RUGOSA 3366
 AGROBACTERIUM 2784
 AILANTHUS EXCELSA 2868
 AIZOACEAE 2768 3019
 AJUGA IVA 3177
 AJUGA REPTANS 2850
 ALBIZZIA AMARA 3277
 ALBIZZIA ANTHELMINTICA 3077
 ALBIZZIA JULIBRISSIN 2958 3194
 ALCEA PALLIDA 2925
 ALEURITES FORDII(PATENT) 3446
 ALISMATACEAE 3450
 ALLIACEAE 3017 3130
 ALLIUM CEPA 3047 3412
 ALLIUM SATIVUM 2771 3017 3024 3037 3047 3134
 3198 3427
 ALLIUM SPP 3413 3426
 ALLIUM URSINUM 3111
 ALLIUM VICTORIALIS 3417
 ALLIUM VINEALE 3111
 ALOE ARBORESCENS 2758
 ALOE BARBADENSIS 3295 3420
 ALOE BERHANA 3149
 ALOE FEROX 3420
 ALOE PERRYI 3420
 ALOE SPP 2967 3372
 ALOE VERA 3420
 ALOE VULGARIS 3420
 ALPINIA OFFICINARUM 2970
 ALSEODAPHNE PERAKENSIS 3242
 ALSTONIA ANGUSTIFOLIA 3074
 ALSTONIA SCHOLARIS 3215
 ALTHAEA OFFICINALIS 3387
 ALTHAEA OFFICINALIS VAR RUSSALKA 3200
 AMALOCALYX YUNNANESIS 3197
 AMARANTHACEAE 2833 2980 3060 3193 3313 3396
 AMARANTHUS SPP 2833
 AMARYLLIDACEAE 3055 3085 3131 3373 3431
 AMMI MAJUS 2847
 AMMI VISNAGA 2847 3007
 AMMOPIPTANTHUS MONGOLICUS 3306
 AMOMUM SCHMIDTTI 3161
 AMSONIA ELLIPTICA 2840
 ANACARDIACEAE 2768 2932 3090 3106
 ANACYCLUS PYRETHRUM 2901 3387
 ANANAS COMOSUS 3337
 ANCHIETEA SALUTARIS 3246
 ANCISTROCLADACEAE 2793 2988 3127 3129 3367
 ANCISTROCLADUS ABBREVIATUS 2988 3129 3367
 ANCISTROCLADUS BARTERI 3127
 ANCISTROCLADUS HEYNEANUS 2793
 ANDROGRAPHIS PANICULATA 2905 3024
 ANEMARRHENA ASPHODELOIDES 3012 3414
 ANEMONE CORONARIA 3204
 ANETHUM GRAVEOLENS 3391 3398
 ANETHUM SOWA 2869
 ANGEELICA ARCHANGELICA 2955
 ANGELICA ARCHANGELICA 2804 3192
 ANGELICA DAHURICA 2967
 ANGELICA PUBESCENS 3309
 ANISODUS LURIDUS 2816
 ANISOMELES MALABARICA 2867
 ANNONACEAE 3058 3081 3145 3235
 ANOGEISSUS LEIOCARPA 3077
 ANTHOCERCIS LITTOREA 2785
 ANTIDESMA PENTANDRUM 3258
 ANTIDESMA PENTANDRUM VAR BARBATUM 3360
 APIACEAE 2774 2808 2954 3118 3180
 APOCYNACEAE 2786 2824 2826 2840 2843 2859
 3074 3086 3197 3215 3375 3385 3436 3438
 AQUILARIACEAE 3224
 ARABIDOPSIS THALIANA 2770
 ARACEAE 2767 2780 3025 3069 3318 3328 3378
 ARACHIS HYPOGAEA 2971 2972 2973 2974
 ARALIACEAE 2877 2935 2979 3004 3070 3219 3221
 3327 3399 3402 3404 3405 3429
 ARECA CATECHU(PATENT) 3453
 ARGANIA SPINOSA 3138 3139
 ARGYREIA SPECIOSA 2780
 ARISTOLOCHIA BOTTAI 3006
 ARISTOLOCHIA GRANDIFLORA 3095
 ARISTOLOCHIA MOLLISSIMA 3141
 ARISTOLOCHIACEAE 3006 3095 3141
 ARNICA AMPLEXICAULIS 3371
 ARNICA CHAMISSONIS SSP FOLIOSA 3249 3324 3371
 ARNICA MONTANA 3249 3371
 ARNICA SACHALINENSIS 3371
 ARTEMISIA AFRA 3264
 ARTEMISIA ANNUA 2857 3349 3353 3438
 ARTEMISIA DRACUNCULUS 3398
 ARTEMISIA DUBIA 3378
 ARTEMISIA LACINIATA 3377
 ARTEMISIA SPP 3100
 ARTOCARPUS INTEGRIFOLIA 2837
 ASCLEPIADACEAE 3104 3113 3294 3355 3385
 ASPARAGACEAE 2906
 ASPARAGUS RACEMOSUS 2780
 ASPHODELACEAE 3149
 ASTERACEAE 2772 2857 2982 3008 3050 3054 3152
 3173 3191 3213 3214 3218 3233 3249 3278 3323
 3324 3353 3371 3374 3378 3388 3403
 ASTRAGALUS COMPLANATUS 3147
 ASTRAGALUS MEMBRANACEUS 2880 2914
 ATRACTYLODES MACROCEPHALA 2880
 ATROPA SPP 2782
 AZADIRACHTA INDICA 2902 3033 3108 3185
 BALANITACEAE 2757 2789 3077
 BALANITES AEGYPTIACA 2789 2815 3077
 BALANITES ROXBURGHII 2757
 BALSAMINACEAE 3356

- BAMBUSIA CHUNGII 3386
 BAPHIA NITIDA 2919 2996
 BAPTISIA AUSTRALIS 3341
 BAPTISIA TINCTORIA 2825
 BERBERIDACEAE 3110 3211 3378
 BERBERIS ASIATICA 3378
 BERBERIS WAZIRISTANICA 3110
 BETULA ALNOIDES 3378
 BETULACEAE 3378 3394
 BIDENS CAMPYLOTHECA 2927 3120 3296
 BIDENS FRONDOSA 3212
 BIGNONIACEAE 2865 2976 3159 3230 3263
 BIOTA ORIENTALIS 2995
 BOCCONIA INTEGRIFOLIA 3265
 BOERHAAVIA DIFFUSA 2885 2902
 BOMBACACEAE 3289
 BORAGINACEAE 3031 3115
 BORRICHIA FRUTESCENS 3154
 BOSWELLIA 3234
 BOUGAINVILLEA SPECTABILIS 2878
 BRIDELIA FERRUGINEA 2997
 BROMELIACEAE 3337
 BRUCEA JAVANICA 3171
 BUDDLEJA OFFICINALIS 3157
 BUDDLEJACEAE 3157
 BUPLEURUM CHINENSE 3025
 BURSERACEAE 3234 3385
 BUTEA FRONDOSA 3310
 BUTEA MONOSPERMA 2868 3385
 CAESALPINIA BONDUCELLA 3387
 CALAMINTHA NEPETA SUBSP GLANDULOSA 3228
 CALENDULA ARVENSIS 3004 3070
 CALENDULA OFFICINALIS 2982 3004 3014
 CALLISTEMON LANCEOLATUS 3069
 CALOPHYLLUM INOPHYLLUM 3091
 CAMASSIA CUSICKII 3250
 CAMPANULACEAE 2813
 CAMPHORA OFFICINARUM 2902
 CANAVALIA ENSIFORMIS 2971 2972 2973 2974 3176
 CANNABINACEAE 2807 3021 3387
 CANNABIS SATIVA 3021
 CANNABIS SATIVA VAR RASTISLAVICE 2807
 CANNABIS SATIVUM 3387
 CAPPARIDACEAE 3418
 CAPPARIS SPINOSA 3418
 CAPRIFOLIACEAE 2914 2949 3232
 CAPSICUM ANNUUM 2771
 CAPSICUM ANNUUM VAR JALAPENO 2855
 CARAGANA CHAMLAGU 3143
 CARTHAMUS SPP(PATENT) 3446
 CARTHAMUS TINCTORIUS 3218
 CARUM CARVI 3398
 CARUM COPTICUM 2902
 CASSIA ITALICA 3163
 CASSIA SIAMEA 3317
 CASSIA TOROSA 3220
 CASTELA EMORYI 3076
 CASTINOSPERMUM AUSTRALE 3438
 CATALPA OVATA 2865
 CATHARANTHUS PUSILLUS 3385
 CATHARANTHUS ROSEUS 2786 2824 2826 2859 3438
 CECROPIACEAE 2965
 CEDRONELLA CANARIENSIS 3165
 CEDRONELLA CANARIENSIS VAR ANISATA 3165
 CEDRUS DEODARA 2869
 CELASTRACEAE 3183 3240 3385
 CELASTRUS PANICULATUS 3385
 CENTAUREA SOLSTITIALIS 3190
 CENTELLA ASIATICA 2994 3033
 CENTRATHERUM ANTHELMINTICUM 3020
 CHAMOMILLA RECUTITA 3173 3403
 CHAPTALIA NUTANS 3054
 CHELIDONIUM MAJUS 2875 3073 3189
 CHENOPODIACEAE 2788 3210 3387
 CHENOPODIUM ALBUM 3387
 CHENOPODIUM AMBROSIODES 3210
 CHIRONIA KREBSII 3354
 CHOISYA TERNATA 2790
 CHRYSANTHEMUM 2980
 CHRYSOPLENium ALTERNIFOLIUM 3126
 CICER ARIETINUM 2788
 CINCHONA ROBUSTA 2835
 CINNAMOMUM GLAUCESCENS 3093
 CINNAMOMUM PORRECTUM 3454
 CINNAMOMUM SPP 3205
 CISSAMPELOS PAREIRA 3097
 CITRUS GRANDIS 2790
 CITRUS RETICULATA 3155 3437
 CITRUS SINENSIS 3112
 CITRUS SPP 3433
 CITRUS TANGERINA 3037
 CLAVICEPS PURPUREA 3410
 CLEISTANTHUS COLLINUS 3005
 CLEMATIS CHINENSIS 3039
 CLEMATIS HEXAPETALA 3039
 CLEMATIS MANSHURICA 3039
 CLEOMACEAE 3164
 CLEOME AMBLYOCARPA 3164
 COCCULUS TRILOBUS 3140
 COCHLOSPERMACEAE 3158
 COCHLOSPERMUM VITIFOLEUM 3158
 COFFEA SPP 2810
 COLCHICUM CORNIGERUM 2983
 COMBRETACEAE 2800 2902 2924 3077 3080 3387
 3434
 COMBRETUM DOLICHOPTEALUM 2924
 COMBRETUM SPP 3080
 COMMIPHORA WIGHTII 3385
 COMPOSITAE 2768 2801 2806 2839 2869 2880 2896
 2901 2920 2927 2956 2980 2985 2986 2999
 3004 3007 3014 3016 3020 3048 3057 3066
 3070 3099 3100 3116 3120 3154 3184 3186
 3190 3200 3207 3212 3239 3253 3254 3260
 3264 3281 3286 3296 3301 3302 3303 3349
 3361 3362 3368 3377 3387 3398 3408 3438
 3446
 CONIFERAE 3179 3438
 CONVULVACEAE 2780 3028 3151 3206 3209 3229
 3350
 CONYZA CANADENSIS 3254
 COPTIS JAPONICA 3255
 COPTIS JAPONICA VAR DISSECTA 2871
 COPTIS QUINQUEFOLIA 3255
 COPTIS SPP 3255
 COPTIS TRIFOLIA 3255
 CORCHORUS DEPRESSUS 3033
 CORDYCEPS MILITARIS 3401
 CORDYCEPS SINENSIS 3026 3401
 CORIANDRUM SATIVUM 3092 3387 3398
 CORYDALIS SOLIDA 3174
 CORYLUS AVELLANA 3394
 COSTUS SPECIOSUS 2815
 COTULA HEMISPHERICA 2772
 CRASSULACEAE 2788

- CRATAEGUS PINNATIFIDA 3037
 CRATAEGUS SPP 2844
 CROCUS SATIVUS 3431
 CROTALARIA SESSILIFLORA 3300
 CROTON LEVATII 3256
 CROTON MACROSTACHYUS 2997
 CROTON MEGALOCARPUS 3088 3089 3348
 CROTON MUCRONIFOLIUS 3058
 CROTON SPP 2998
 CROTON TIGLIUM 2950
 CROTON TRIANGULARIS 3058
 CRUCIFERAE 2770 3225
 CRYPTOLEPIS SANGUINOLENTA 3051
 CUCURBITACEAE 2854 2923 2968 3284
 CUMINUM CYMINUM 3118
 CUPRESSACEAE 2995 3087 3167 3168
 CURCUMA AMADA 2771
 CURCUMA DOMESTICA 2771 3378
 CURCUMA LONGA 2759 2763 2902 3000 3015 3181
 3376 3424
 CURCUMA XANTHORRHIZA(PATENT) 3449
 CURCUMA ZEDOARIA 3025 3387
 CUSCUTA PLATYLOBA 2787
 CUSCUTA REFLEXA 2787
 CUSCUTACEAE 2787
 CYBISTETES LONGIFOLIA 3131
 CYMBIDIUM ALOIFOLIUM 3178
 CYMBOPETALUM PENDULIFLORUM 3235
 CYMBOPOGN NARVATUS 3077
 CYMBOPOGON CITRATUS 3096 3259
 CYMBOPOGON FLEXUOSUS 2775
 CYMBOPOGON NARDUS 3058
 CYNANCHUM CHINENSE 3355
 CYNARA SCOLYMUS 3191
 CYTHIDACEAE 2941
 CYTISUS 2787
 DALBERGIA PANICULATA 3288 3292
 DAMNACANTHUS OFFICINARUM 3003
 DAPHNE MEZEREUM 2951
 DATURA INNOXIA 2831
 DATURA METEL 3001
 DATURA SPP 2782
 DATURA STRAMONIUM 2785 2799 2831
 DAUCUS CARROTA 3234
 DELPHINIUM ELATUM 3344
 DETARIUM MICROCARPUM 3107
 DICTAMNUS ALBUS 2790
 DICTYOTA DICHOTOMA VAR IMPLEXA 3082
 DICTYOTACEAE 3082
 DIDYMOCARPUS PEDICELLATA 3188
 DIGITALIS ATLANTICA 3238
 DIGITALIS CARIENSIS SSP. LAMARCKII 3169
 DIGITALIS CARIUNSISS SSP TROJANA 3169
 DIGITALIS CILIATA 3238
 DIGITALIS FERRUGINEA 3169
 DIGITALIS LANATA 2762 2805 3169
 DIGITALIS NERVOSA 3238
 DIGITALIS OBSCURA 2803 2821
 DIGITALIS SPP 2912 2913
 DIONCOPHYLLACEAE 3128 3367
 DIOSCOREA FLORIBUNDA 2764
 DIOSCOREA ROTUNDATA 2792
 DIOSCOREA SPP 2815 2980
 DIOSCOREACEAE 2764 2792 2815 2980
 DIOSPYROS DISCOLOR 3320
 DIOSPYROS KAKI 3195
 DIOSPYROS RAMULOSA 2768
 DIOSPYROS VIRGIANA 3195
 DIPSACACEAE 3364
 DIPSACUS ASPER 3364
 DITTRICHIA VISCOSA 3186
 DOLICHOS BIFLORUS 2971 2972 2973 2974
 DUBOISIA LEICHHARDTII 2782
 DYSOPHYLLA TOMENTOSA 3083
 DYSOXYLUM LENTICELLARE 3101
 EBENACEAE 2768 3195 3314 3320
 ECHINACEA PURPUREA 3048
 ECHINACEA SPP 3371
 ECLIPTA ALBA 3408
 ELEUTHEROCOCCUS SENTICOSUS 3429
 ELLIPEIA CUNEIFOLIA 3145
 ELSHOLTZIA BLANDA 3122
 EMBLICA OFFICINALIS 2902
 EMBLICA RIBES 2868
 EPHEDRA SPP 2898
 EPHEDRACEAE 2898
 EPIMEDIUM SPP 3211
 ERICACEAE 3148 3400
 ERIGERON CANADENSIS 3254
 ERIOCEPHALUS ERIOCOIDES 2768
 ERIOCEPHALUS PUNCTULATUS 3152
 ERYTHRINA INDICA 2868
 ESCHSCHOLTZIA CALIFORNICA 2796
 EUCALYPTUS JENSENII 3125
 EUCALYPTUS RESINIFERA 3199
 EUCALYPTUS SPP 2798
 EUCLEA CRISPA 3314
 EUPATORIUM ODORATUM 3233
 EUPATORIUM RIPARIUM 3066
 EUPHORBIA CYPARISSIAS 2951
 EUPHORBIA HUMIFUSA 2890
 EUPHORBIA KANSUI 2823
 EUPHORBIAEAE 2812 2823 2868 2890 2902 2905
 2939 2943 2950 2951 2952 2972 2973 2974
 2997 2998 3005 3058 3088 3089 3256 3258 3305
 3348 3358 3360 3446
 EVOLVULUS ALSINOIDES 2780
 FABACEAE 2825 3241 3262 3306 3341 3345 3385
 FAGACEAE 3274
 FICOIDACEAE 3033
 FICUS ADENOSPERMA 3121
 FICUS SYRINGIFOLIA 3063
 FLUEGGEA MICROCARPA 2943
 FOENICULUM VULGARE 3096 3398
 FRAGARIA VESCA 3394
 FRAXINUS ANGUSTIFOLIA 3196
 FRITILLARIA NINGGUOENSIS 3237
 FUMARIA INDICA 3109 3332
 FUMARIAEAE 3109 3174 3332
 GALBULIMIMA BACCATA 2948
 GALENIA AFRICANA 2768
 GALIUM HELDREICHII 3335
 GALPHIMIA GLAUCA 3027
 GARCINIA KOLA 3091 3269
 GARDENIA JASMINOIDES 3285
 GARDENIA JOVIS TONANTIS 3059
 GENISTA TINCTORIA 3341
 GENISTA TRIDENTATA 2957
 GENISTEAE 3144
 GENTIANACEAE 2987 3354
 GERANIACEAE 3068
 GERANIUM SANGUINEUM 3068
 GESNERIACEAE 3188
 GETHYLLIS SPP 3373

- GINKGO SPP(PATENT) 3445
 GINKGO BILOBA 2802 3395 3404 3438
 GINKGOACEAE 2802 3395 3404 3438 3445
 GLYCINE SPP 2946
 GLYCYRRHIZA GLABRA 2783 3219 3393
 GLYCYRRHIZA INFLATA 3156 3219
 GLYCYRRHIZA SPP 2898 3363
 GLYCYRRHIZA URALENSIS 3219
 GLYCYRRHIZA YUNNANENSIS 3267
 GOMPHRENA GLOBOSA 3193 3396
 GOSSYPIUM HIRSUTUM 2797
 GRAMINEAE 2766 2940 2946 2971 2972 2973 2974
 3058 3077 3096 3259 3347 3386
 GRASULARIACEAE 3331
 GRINDELIA ROBUSTA 3207
 GRINDELIA SQUARROSA 3207
 GUAIAECUM OFFICINALE 3098
 GUTIERREZIA RESINOSA 3361
 GUTTIFERAE 2909 3091 3269 3287
 HAEMANTHUS ALBIFLOS 3055
 HEDERA HELIX 3004 3070 3404
 HEDERA RHOMBEA 2979
 HEDYCHIUM ANCUMINATUM 3275
 HEDYCHIUM AURANTIACUM 3275
 HELIANTHUS ANNUUS 3323
 HELICHRYSUM STOECHAS 3008
 HEMIDESMUS INDICUS 3150 3385
 HEMIZYGIA WELWITSCHII 3065
 HERMANNIA DISERMIFOLIA 2768
 HETEROCENTRON ROSEUM 3359
 HIBISCUS ROSA-SINENSIS 3018
 HIBISCUS SPP(PATENT) 3452
 HIPPOCASTANACEAE 2928
 HOMALOMENA AROMATICA 3328
 HOYA AUSTRALIS 3113
 HYACINTHACEAE 3226 3227
 HYOSCYAMUS ALBUS 2785 2841
 HYOSCYAMUS MUTICUS 2761 2784 2828
 HYOSCYAMUS NIGER 2831
 HYOSCYAMUS SPP 2782
 HYPERICACEAE 3244 3404
 HYPERICUM PERFORATUM 2909 3244 3404
 HYPOCREACEAE 3026 3401
 HYSSOPUS OFFICINALE 3398
 IMPATIENS BALSAMINA 3356
 INULA VISCOSA 3186
 IOCHROMA COCCINEUM 3102
 IPOMOEAE ANGULATA 3206
 IPOMOEAE AQUATICA 3028 3209
 IPOMOEAE OBSCURA 3350
 IRIDACEAE 3431
 ISOPLEXIS CANARIENSIS VAR TOMENTOSA 3061
 JASMINUM GRANDIFLORUM 2976
 JASMINUM OFFICINALE 3234
 JASMINUM SAMBAC 3234
 JATROPHA GROSSIDENTATA 3305
 JUGLANDACEAE 3394
 JUGLANS REGIA 3394
 JUMELLEAE FRAGRANS 3142
 JUNIPERUS EXCELSA 3087
 JUNIPERUS SEMIGLOBOSA 3087
 JUNIPERUS THURIFERA 3167 3168
 KADSURA HETEROCLITA 3042
 KALANCHOE DAIGREMONTIANA 2788
 KALANCHOE TUBIFLORA 2788
 LABIATAE 2762 2765 2779 2850 2867 2902 2903
 2904 2930 2975 3007 3012 3033 3036 3056
 3072 3096 3114 3117 3122 3124 3133 3136 3137
 3179 3182 3228 3247 3252 3293 3298 3307
 3308 3312 3336 3340 3365 3366 3369 3370
 3398 3407
 LAMIACEAE 2942 2949 3065 3067 3083 3165 3248
 3342
 LATHYRUS LATIFOLIUS 2811
 LAURACEAE 2902 3069 3075 3093 3205 3242 3454
 LAURUS NOBILIS 3069
 LAVANDULA ANGUSTIFOLIA 3398
 LAVENDULA PEROTTETTI 3083
 LEGUMINOSAE 2783 2787 2788 2811 2815 2817 2818
 2832 2851 2862 2868 2880 2898 2914 2922
 2945 2946 2957 2958 2971 2972 2973 2974
 2990 2992 2996 3012 3025 3077 3084 3105
 3107 3143 3146 3147 3156 3163 3176 3194
 3219 3220 3236 3243 3267 3277 3288 3292
 3300 3304 3310 3317 3338 3363 3387 3393
 3438
 LEMNACEAE 3094
 LEONURUS CARDIACA 3007 3307
 LESPEDEZA CAPITATA 3345
 LEUCAENA LEUCOCEPHALA 2992
 LEUCAS ASPERA 2867 3252
 LIBONOTIS INTERMEDIA SSP INTERMEDIUM 3180
 LIGUSTICUM CHUANGXIONG 3257
 LILIACEAE 2758 2771 2780 2815 2914 2931 2967
 2983 3012 3024 3047 3111 3134 3198 3237
 3250 3251 3295 3372 3412 3413 3414 3417
 3420 3426 3427
 LILIUM DAURICUM 3251
 LINGNANIA CHUNGII 3386
 LIPPIA DULCIS 2840
 LIPPIA GRACILIS 3058
 LIPPIA MICROPHYLLA 3058
 LOBELIA INFLATA 2813
 LOGANIACEAE 3053 3153
 LONICERA IMPLEXA 2949
 LONICERA JAPONICA 2914
 LUPINUS POLYPHYLLUS 3341
 LUPINUS SPP 2787 2922
 LYCIUM SPP 2815
 LYCOPUS LUCIDUS 3312
 LYGOS RAETAM 2862
 MADHUCA INDICA 2869
 MAGNOLIACEAE 3003
 MAJORANA HORTENSIS 2762
 MAJORANA SIPYLEA 3117
 MALLOTUS PHILIPENSIS 2868
 MALPIGHIACEAE 3027
 MALVACEAE 2797 2925 3018 3387 3452
 MAMMEA LONGIFOLIA 3287
 MANDRAGORA OFFICINARUM 3170
 MANGIFERA INDICA 3090
 MATRICARIA CHAMOMILLA 3057
 MAYTENUS CANARIENSIS 3183
 MELASTOMATAACEAE 3359
 MELIA AZEDARACH 3033
 MELIACEAE 2902 3033 3101 3108 3185 3406
 MELILOTUS OFFICINALIS 3406
 MELISSA OFFICINALIS 3179
 MELISSA PARVIFLORA 3293
 MELOCHIA COROCHORIFOLIA 3123
 MELOCHIA PYRAMIDATA 3123
 MELOCHIA TOMENTOSA 3123
 MELOCHIA UMBELLATA 3123
 MEMISPERMACEAE 2773

- MENISPERMACEAE 3035 3097 3140
 MENTHA ARVENSIS 2765
 MENTHA LONGIFOLIA 3370
 MENTHA PIPERITA 2762
 MENTHA SYLVESTICA 2902
 MERREMIA TRIDENTATA 3229
 MICROGLOSSA PYRIFOLIA 3302
 MIKANIA CORDATA 2985 2986
 MIMOSA TENUIFLORA 2963
 MIMOSACEAE 2963
 MOMORDICA CHARANTIA 2968
 MONADENIUM LUGARDIAE 2952
 MORACEAE 2837 3063 3121
 MORINDA OFFICINALIS 3003
 MORINGA PTERYGOSPERMA 2902
 MORINGACEAE 2902
 MURRAYA EUCHRESTIFOLIA 3203
 MURRAYA PANICULA 3438
 MURRAYA PANICULATA 2790
 MUSA BALBISIANA 3103
 MUSACEAE 3103
 MUSANGA CECROPIOIDES 2965
 MYRICA GALE 3245
 MYRICACEAE 3245
 MYRTACEAE 2795 2798 3030 3062 3069 3125 3199
 3334 3339
 NARDOSTACHYS JATAMANSI 2869 3033
 NELUMBO NUCIFERA 2989
 NICOTIANA 2787 3321
 NICOTIANA PLUMBAGINIFOLIA 2819
 NICOTIANA SUAVEOLENS 2822
 NICOTIANA SYLVESTRIS 2822
 NICOTIANA TABACUM 2794
 NIGELLA SATIVA 3033 3052
 NYCTAGINACEAE 2878 2885 2902
 NYCTANTHES ARBOR-TRISTIS 3315
 NYMPHAEACEAE 2989
 OCHINA SQUARROSA 3261
 OCHNACEAE 3261
 OCIMUM GRATISSIMUM 3136
 OCIMUM KILIMANDSCHARICUM 2779 3137
 OCIMUM SANCTUM 2867 3033 3096
 OENANTHE AQUATICA 2853
 OENOTHERA SPP 2760
 OLACACEAE 3063
 OLDENLANDIA CORYMBOSA 3024
 OLDENLANDIA DIFFUSA 2880
 OLEA EUROPAEA 2933
 OLEACEAE 2933 2976 3196 3234 3315 3326
 OLEARIA TERETIFOLIA 3362
 ONAGRACEAE 2760
 ONONIS ARVENSIS 2851
 OPHIOPOGON JAPONICUS 2914
 ORCHIDACEAE 3015 3142 3266
 ORCHIS INCARNATA 3015
 ORIGANUM MAJORANA 3398
 ORIGANUM SIPYLEUM 3117
 ORIGANUM VULGARE 3398
 ORIXA JAPONICA 2790
 ORTHOSIPHON ARISTATUS 2942
 ORXYLUM INDICUM 2868
 ORYZA SPP 3347
 OSMANTHUS ASIATICUS 3326
 OSMANTHUS FRAGRANS 3234
 PACHYRHIZUS TUBEROSUS 3241
 PAEDERIA FOETIDA 2869
 PAEONIA ALBIFLORA 3415
 PAEONIA LACTIFLORA 2880 2884 2903
 PAEONIACEAE 2880 2884 2903 3415
 PALMAE 3453
 PANAX 2877
 PANAX GINSENG 2935 3219 3221 3399 3405 3429
 PANAX JAPONICUS 3405
 PANAX NOTOGINSENG 3402
 PANCRACTIUM MARITIMUM 3085
 PAPAVER BRACTEATUM 2834
 PAPAVER SOMNIFERUM 2778 2834
 PAPAVER SOMNIFERUM VAR ALBUM 3162
 PAPAVER SOMNIFERUM VAR NIGRUM 3162
 PAPAVERACEAE 2778 2796 2814 2834 2875 3073
 3162 3189 3265
 PAPILLIONACEAE 2919
 PARNASSIA PALUSTRIA 3394
 PEDALIACEAE 2869 3282
 PENSTEMON SERRULATUS 2858 3041
 PENTATROPIS SPIRALIS 3294
 PERIPLOCACEAE 3051 3150
 PERSEA INDICA 3075
 PETERSIANTHUS MACROCARPUS 2941
 PETROSELINUM CRISPUM 2788 2827 3398
 PETTERIA RAMENTACEA 3341
 PEUCEDANUM ARENARIUM 2954
 PEUCEDANUM AUSTRIACUM 2954
 PEUCEDANUM JAPONICUM 2938 3411
 PEUCEDANUM OFFICINALE 2954
 PEUCEDANUM OREOSELINUM 2954
 PEUCEDANUM OSTRUTHIUM 3007
 PEUCEDANUM PALUSTRE 2808
 PFAFFIA PULVERULENTA 3313
 PHASEOLUS VULGARIS 2788 2990
 PHELLODENDRON CHINENSE 3311
 PHELLODENDRON AMURENSE 2790
 PHLOMIS CRINITA 2949
 PHYLLANTHUS EMBLICA 2905
 PHYLLANTHUS FLEXUOSUS 3358
 PHYLLANTHUS NIRURI 2812
 PHYTOLACCA AMERICANA 3172
 PHYTOLACCA SPP(PATENT) 3451
 PHYTOLACCACEAE 3172 3451
 PICEA ABIES 3179
 PICRAMMA JAVANICA 3222
 PICRODENDRON BACCATUM 3329
 PICRORHIZA KURROOA 2961 3015 3022
 PIMENTA ABSCURA 3334
 PINACEAE 2869 3387
 PINELLIA TERNATA 3025
 PINUS SUCCINEFERA 3387
 PIPER ADUNCUM 3270
 PIPER BETLE 2769 - 2867 3024 3357
 PIPER CUBEBA 3343
 PIPER GUINEENSE 2997 3081
 PIPER LONGUM 2869
 PIPER NIGRUM 3234
 PIPERACEAE 2769 2867 2869 2953 2997 3024 3081
 3234 3270 3343 3357
 PIQUERIA TRINERVIA 3050
 PISTACIA INTEGERRIMA 3106
 PISUM SATIVUM 2788
 PITHECELLOBIUM LOBATUM 3236
 PLANTAGINACEAE 2776 2777
 PLANTAGO OVATA 2776 2777
 PLUCHEA FASTIGIATA 3239
 PLUCHEA INDICA 3016
 PLUMBAGINACEAE 2869

- PLUMBAGO ZEYLANICA 2869
 POACEAE 2775
 PODOCARPACEAE 3079
 PODOCARPUS ANDINA 3079
 POGOSTEMON PLECTRANTHOIDES 3083
 POLIANTHES TUBEROSA 3431
 POLYGALA JAPONICA 3160
 POLYGALA NYIKENSIS 3322
 POLYGALA VIRGATA 3119
 POLYGALACEAE 3119 3160 3322
 POLYGONACEAE 2889 3325 3419
 POLYGONUM MULTIFLORUM 3419
 POLYPORACEAE 3045
 POLYPORUS UMBELLATUS 3045
 PONCIRUS TRIFOLIATA 2790
 PORIA COCOS 2890
 PORTULACA OLERACEA 3352
 PORTULACACEAE 3352
 POTENTILLA ANSERINA 3223
 POTHOMORPHE PELTATA 2953
 PRUNUS CERASUS 3135
 PRUNUS SPINOSA 3201
 PSIDIUM GUAJAVA 2795
 PSOPHOCARPUS TETRAGONOLOBUS 2832
 PTERIDACEAE 2937
 PUERARIA LOBATA 3012
 PULICARIA UNDULATA 3213
 QUAMODIT COCCINEA 3151
 QUAMODIT PHOENICEA 3151
 QUERCUS PETRACEA 3274
 QUINCHAMALIUM CHILENSE 3132
 RABDOSIA EXCISA 3365
 RANUNCULACEAE 2871 2885 3033 3039 3052 3175
 3204 3219 3255 3319 3344
 RAPHANUS SATIVUS SUBVAR RADICULA 3225
 RAUVOLFIA SERPENTINA 3375
 REHMANNIA 2980
 REHMANNIA GLUTICOSA 3219
 RETAMA SPHAEROCARPA 3146
 RHAMNACEAE 3037 3276
 RHEUM 2889
 RHUS BURCHELLI 2768
 RHYNCHOSIA BRACTEATA 3262
 RHYNCHOSIA SUBLOBATA 3262
 RHYNCOSIA MINIMA 3077
 RIBES NIGRUM 3331
 RICINUS COMMUNIS 2939 2972 2973 2974
 ROSA DAMASCENA 2902 3389
 ROSACEAE 2844 2902 3009 3037 3135 3201 3223
 3268 3271 3272 3297 3333 3389 3394
 RUBIA PEREGRINA 3283
 RUBIACEAE 2810 2835 2959 3003 3024 3059 3208
 3216 3283 3285 3330 3335
 RUBUS IDAEUS 3271 3272
 RUBUS SUAVISSIMUS 3268
 RUMEX PULCHER 3325
 RUSCUS ACULEATUS 2906
 RUTA GRAVEOLENS 2790 2791 3007
 RUTACEAE 2790 2791 2870 2997 3007 3037 3112
 3155 3203 3311 3385 3433 3437 3438 3447
 SALVIA AFRICANA 3182
 SALVIA MILTIORRHIZA 2903 2904 2930 3036
 SALVIA MONTBRETI 3336
 SALVIA OFFICINALIS 3056 3398
 SALVIA SCLAREA 3407
 SAMBUCUS NIGRA 3232
 SANGUISORBA MINOR 3009
 SANGUISORBA OFFICINALIS 3009 3297
 SANTALACEAE 2867 2902 3132
 SANTALUM ALBUM 2867 2902
 SANTALUM RUBURUM 2902
 SAPINDACEAE 3004 3070
 SAPINDUS MUKUROSSI 3004 3070
 SAPOTACEAE 2869 3138 3139
 SARCOPOTERIUM SPINOSUM 3009
 SATUREJA HORTENSIS 3398
 SAXIFRAGACEAE 3126 3394
 SCHEFFERA OCTOPHYLLA 3327
 SCHISANDRA PROPINQUA 3003
 SCHIZANDRACEAE 3042
 SCHUMANNIOPHYTON MAGNIFICUM 2959
 SCOLYMUS HISPANICUS 3301
 SCROPHULARIA AURICULATA 2949 3299
 SCROPHULARIA ILWENSIS 3392
 SCROPHULARIA KORAIENSIS 3273
 SCROPHULARIA NINGPOENSIS 3002
 SCROPHULARIACEAE 2762 2803 2805 2821 2858 2912
 2913 2949 2961 2980 3002 3015 3022 3041
 3061 3063 3077 3169 3219 3231 3238 3273
 3290 3299 3392
 SCUTELLARIA BAICALENSIS 2975 3012
 SECIUM EDULE 2854
 SESAMUM ALATUM 3282
 SESAMUM INDICUM 2869
 SESBANIA SESBAN 3077
 SIDA CORDIFOLIA 2869
 SIDERITIS CLANDESTINA SSP CLANDESTINA 3067
 SIDERITIS JAVALAMBRENSIS 3298
 SIDERITIS SCARDICA 3248
 SILYBUM EBURNEUM 2774
 SILYBUM MARIANUM 2774 2801 2806 2896 2956 2999
 SIMAROUBACEAE 2815 2868 3171 3222 3329
 SIMAROUBEACEAE 3076
 SINOMENIUM ACUTUM 3035
 SKIMMIA JAPONICA 2790
 SOBRALIA VIOLACEA 3266
 SOLANACEAE 2761 2771 2780 2781 2782 2784 2785
 2787 2794 2799 2816 2819 2822 2828 2831
 2838 2841 2846 2852 2855 2885 3001 3029
 3033 3102 3166 3170 3321 3346 3378 3385
 SOLANUM 2838
 SOLANUM AVICULARE 2852
 SOLANUM DULCAMARA 3346
 SOLANUM FEROX 3385
 SOLANUM MELONGENA 3033
 SOLANUM TORVUM 3378
 SOLANUM TUBEROSUM CV SATURNA 3166
 SOLANUM VESTISSIMUM 2846
 SOLIDAGO GIGANTEA 3007
 SOLIDAGO VIRGAUREA 3388
 SOPHORA FLAVESCENS 3025
 SORBUS TORMINALIS 3333
 SORGHUM SPP 2940
 SPARTIUM 2787
 SPATHODEA CAMPANULATA 3263
 SPHACELE CHAMAEDRYOIDES 3340
 SPINACIA OLERACEA 2788
 SPONDIAS MOMBIN 2932
 STACHYS AEGYPTIACA 3247
 STEMMADENIA MINIMA 3086
 STERCULIA FOETIDA 2829
 STERCULIACEAE 2768 2829 3123
 STRIGA HERMONTHICA 3077
 STRIGA LUTEA 3290

- STRIGA SENEGALENSIS 3063
 STROBILANTHES CALLOSUS 3351
 STRYCHNOS GOSSWEILERI 3053
 STRYCHNOS NUX-VOMICA 3153
 SWERTIA CHIRATA 2987
 SYMPHYTUM CAUCASICUM 3115
 SYMPHYTUM OFFICINALE 3031
 SYZYGIUM AROMATICUM 3030
 SYZYGIUM BRAZZAVILLIENSE 3062
 SYZYGIUM CUMINI 3339
 TABERNAEMONTANA DIVARICATA 2843
 TANACETUM ANNUUM 3116
 TANACETUM FERULACEUM 3184
 TANACETUM PTARMICAEFLORUM 3184
 TANACETUM VULGARE 3260
 TARAXACUM MONGOLICUM 2880
 TARENNA VANPRUKII 3330
 TAVERNIERA ABYSSINICA 3084
 TAXACEAE 2820 2856 3032 3033
 TAXUS BACCATA 3033
 TAXUS BREVIFOLIA 2820 2856
 TAXUS SPP 3438
 TAXUS YUNNANENSIS 3032
 TECLEA VERDOORNIANA(PATENT) 3447
 TECOMA ARGENTEA 3159
 TECOMA STANS 2976 3230
 TERMINALIA CATAPPA 2800
 TERMINALIA CHEBULA 2902 3387 3434
 TETRAPLEURA TETRAPTERA 3243
 TEUCRIUM ALGARBIENSE 3133
 TEUCRIUM ARDUINI 3124
 TEUCRIUM FRUITCANS 3308
 TEUCRIUM POLIUM SSP EXPANSUM 3308
 THALICTRUM MINUS 3175
 THALICTRUM MINUS SSP ELATUM 3319
 THEA SINENSIS 2899 3011
 THEACEAE 2899 3011
 THEVETIA NERIIFOLIA 2786
 THYMELAEACEAE 2950 2951
 THYMOPHYLLA BELENIDIUM 3303
 THYMUS ANTONINAE 3342
 THYMUS PULEGIOIDES SSP CHAMAEDRYIS 3369
 THYMUS VULGARIS 3398
 TILIA ARGENTEA 2925
 TILIACEAE 2925 3033
 TIMONIUS TIMON 3216
 TINOSPORA CORDIFOLIA 2773
 TRAGOPOGON PRATENSIS 3253
 TREMA GUINEENSE 2926
 TREMA MICRANTHA 2926
 TRIANTHEMA PORTULACASTRUM 3019 3033
 TRIBULUS TERRESTRIS 2885
 TRICHOSANTHES KIRILOVII 3284
 TRIFOLIUM REPENS 3304
 TRIGONELLA FOENUM-GRAECUM 2815
 TRIGONELLA POLYCERATA 2817 2818
 TRILLIUM SPP 2815
 TRIPHYOPHYLLUM PELTATUM 3128
 TRIPTERYGIUM WILFORDII 3240
 TRITICUM SPP 2946
 TRITICUM VULGARE 2971 2972 2973 2974
 TROPAEOLACEAE 2809
 TROPAEOLUM MAJUS 2809
 TULBAGHIA VIOLACEA 3130
 TUSSILAGO SPP 3371
 TYLOPHORA HIRSUTA 3104
 ULEX EUROPAEUS 2971 2972 2973 2974 3341
 ULMACEAE 2926
 UMBELLIFERAE 2788 2804 2827 2847 2853 2869
 2902 2938 2955 2967 2994 3007 3025 3033
 3092 3096 3192 3234 3257 3309 3387 3391
 3398 3411
 UNCARIA 3208
 URGINEA EPIGEA 3226
 URGINEA PANCRATION 3227
 URTICA DIOICA 2861
 URTICACEAE 2861
 VACCINIUM MYRTILLUS 3400
 VACCINIUM ULIGINOSUM 3148
 VALERIANA EDULIS 3421
 VALERIANA JATAMANSI 3421
 VALERIANA OFFICINALIS 3096 3421
 VALERIANA SPP 3010
 VALERIANA WALLICHII 3033 3421
 VALERIANACEAE 2869 3010 3033 3096 3421
 VELLOZIA PATENS 3279
 VELLOZIA VARIABILIS 3280
 VELLOZIACEAE 3279 3280
 VENTILAGO BOMBAIENSIS 3276
 VERATRUM FORMOSANUM 2931
 VERBENACEAE 2815 2840 2902 3058
 VERNONIA AMYGDALINA 2920
 VERNONIA ANTHELMINTICA 3099
 VERNONIA EXTENSA 3281
 VERNONIA GLUTINOSA 3286
 VERONICA ANAGALLIS-AQUATICA VAR ANAGALLOIDES
 3231
 VETIVERIA ZIZANIOIDES 2766
 VICIA FABA 2788
 VINCA SPP 3436
 VIOLA CALCARATA 2864
 VIOLA LUTEA 2864
 VIOLA ODORATA 2864
 VIOLACEAE 2864 3246
 VISCACEAE 2842
 VISCUM ALBUM 2842
 VITACEAE 2845
 VITEX NEGUNDO 2902
 VITIS VINIFERA 2845
 WADELIA CALENDULACEA 3408
 WERNERIA CILIOLOATA 3278
 WILBRANDIA SPECIES 2923
 WITHANIA SOMNIFERA 2780 2781 2885 3029 3033
 XANTHIUM ITALICUM 3374
 XANTHIUM SPINOSUM 3374
 XIMENIA AMERICANA 3063
 XYLOPIA AETHIOPICA 3081
 XYLOPIA SERICEA 3058
 ZANTEDESHA AETHIOPICA 3318
 ZANTHOXYLUM AILANTHOIDES 2870
 ZANTHOXYLUM ARMATUM 2870 3015
 ZANTHOXYLUM AVICENNAE 2870
 ZANTHOXYLUM BUNGEANUM 2870
 ZANTHOXYLUM CHALYBEUM 2997
 ZANTHOXYLUM MOLLE 2870
 ZANTHOXYLUM NITIDUM 2870
 ZANTHOXYLUM SCHINIFOLIUM 2870
 ZANTHOXYLUM SIMULANS 2870
 ZINGIBER AROMATICUM 3024
 ZINGIBER OFFICINALE 2771 2970 3217
 ZINGIBER OFFICINALE VAR RUBENS 2848 2849
 ZINGIBERACEAE 2759 2763 2771 2815 2848 2849
 2902 2970 3000 3015 3024 3025 3037 3064
 3161 3181 3217 3275 3376 3378 3387 3424 3449

ZIZIPHORA TAURICA SSP CLEONIOIDES 3072

ZIZIPHORA TAURICA SSP TAURICA 3072

ZIZYPHUS JUJUBA 3037

ZYGOPHYLLACEAE 2885 3098

**FREE
GIFT
WITH
COMPLETE SET**



GOLDEN OFFER

You can now book your copies of the
attractive, lavishly illustrated popular science titles under
CSIR GOLDEN JUBILEE SERIES
in advance and also get a

FREE GIFT

Titles in print

BODY'S BATTLES By Bal Phondke

Unfolds the story of the inner defence organisation of the body, the diversity and specificity of its armament and its round the clock vigil that meets every threat to it.

84 pages; Price: Rs.15 (Paperback), Rs. 18 (Hardcover)

MINING THE OCEAN By T K S Murthy

Reveals, the timeless secrets of the seas and the secret bounty that they hold in reserve.

106 pages; Price: Rs. 12 (Paperback), Rs. 20 (Hardcover)

HIS MASTER'S SLAVE By Tapan Bhattacharya

Tells the non-specialist the riveting story of the modern day genie of the bottle, the PC.

88 pages; Price: Rs. 10 (Paperback), Rs. 18 (Hardcover)

INSIDE STARS

By Biman Basu

Provides a privileged glimpse into star nurseries, tracking the luminescent trail to fiery senescence and death of stars to reveal the mysteries and marvels of cosmic drama.

90 pages; Price: Rs. 10 (Paperback), Rs. 18 (Hardcover)

PLASTIC FEAST

By Subodh Jawadekar

Celebrates the dawn of the plastics era and elaborates the myriad ways in which plastics touch our lives. A veritable feast of plastics, very palatable to the readers.

96 pages; Price: Rs. 12 (Paperback) Rs. 20 (Hardcover)

CERAMICS ARE FOREVER

By B C Sharma

Highlights the fascinating versatility of ceramics and provides an excellent close-up of the symbiotic relationship between man and materials.

84 pages; Price: Rs. 11 (Paperback), Rs. 20 (Hardcover)

ARTIFICIAL INTELLIGENCE

By K.D. Pavate

Unveils the many facts of Artificial Intelligence
98 pages; Price: Rs.13 (Paperback), Rs.21 (Hardcover)

Forthcoming Titles

HARDY COMPOSITES

MAN IN SPACE

MIND MASTER

You may place an order for all 10 titles by sending Rs.120.00 (for paperback) or Rs.200.00 (for Hardcover) including postage by Demand Draft/M.O. payable to "Publications and Information Directorate". The titles already published will be sent to you as soon as the payment is received and the forthcoming titles will be sent by post as soon as they are published, one every month. With every order you will receive a free gift.

For further information write to:
Sales and Distribution Officer
Publications and Information Directorate (CSIR)
Dr. K S Krishnan Marg, New Delhi 110 012

OUR AGENTS: - BANGALORE, Navakarnataka Publications Pvt. Ltd., Embassy Centre, 11, Crescent Road, Kumara Park East, Bangalore - 560 001; BHOPAL, Ajay Publishers & Distributors, 74, Motia Park, Behind Moti Masjid, Bhopal-460 001; BOMBAY, Strand Book Stall, Sir Ferozeshah Mehta Road, Fort, Bombay - 400 001, Universal Book Corporation, 546, Kalabadevi Road, Dhobi Talao, P.B. No.2540, Bombay - 400 00; CALCUTTA, Manisha Granthalaya (P) Ltd., 4/3 B, Bankim Chatterjee Street, Calcutta-700 073; MYSORE, People's Book House, J.M. Place Road, Mysore - 570 024; NEW DELHI, Sangam Book Depot, 4378/4B, Ansari Road, Darya Ganj, New Delhi - 110 002, UBS Publishers Distributors Ltd., 5, Ansari Road, Darya Ganj, New Delhi - 110 002; PATNA, Sunil News Agency, Yogiatioli, Patna - 800 001; PUNE, Satish Book Distributors, 27/B, Siddharth Chambers, Opp. Balwant Chowk, Budhwar Peth, Pune 411 002.

Printed & Published by Dr. G.P. Phondke, Director, Publications & Information Directorate (PID)
Dr. K.S. Krishnan Marg, New Delhi 110 012, at PID.

DON'T MISS THE LATEST COLOURS!
NOT TO BE MISSED THE LATEST STYLE TOO!
BUY THE QUALITY!

Advanced Technique for **MORE COMFORT.**



TIME



LATEST-FASHION



We are in step with TIME.

action[®]
SHOES